brother

Brother Laser Printer

HL-1650/1670N

USER'S GUIDE

Please read this manual thoroughly before using the printer. You can print or view this manual from the CD-ROM at any time, please keep the CD-ROM in a convenient place for quick and easy reference at all times.

brother

Laser Printer

HL-1650/1670N

USER'S GUIDE

(For USA & CANADA Only)

IMPORTANT NOTE: For technical and operational assistance, you must call. Calls must be made ***from within*** that country.

In USA 1-800-276-7746

In CANADA 1-800-853-6660
1-514-685-6464 (within Montreal)

If you have comments or suggestions, please write us at:

In USA Printer Customer Support
Brother International Corporation
15 Musick
Irvine, CA 92618

In CANADA Brother International Corporation (Canada), Ltd.
- Marketing Dept.
1, rue Hôtel de Ville
Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BROTHER FAX-BACK SYSTEM
Brother Customer Service has installed an easy to use fax-back system so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one from which you are calling.
Call and follow the voice prompts to receive faxed instructions on how to use the system and your index of fax-back subjects.

In USA 1-800-521-2846

In Canada 1-800-685-5381
1-514-685-5381 (within Montreal)

DEALERS/SERVICE CENTERS (USA only)
For the name of a Brother authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660.

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:

Warning

Indicates warnings that must be observed to prevent possible personal injury.

Caution

Indicates cautions that must be observed to use the printer properly or prevent damage to the printer.

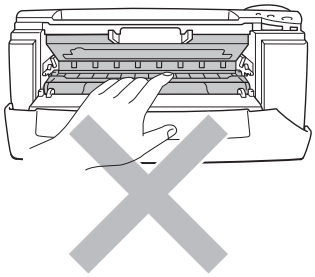
Note

Indicates notes and useful tips to remember when using the printer.

To Use the Printer Safely

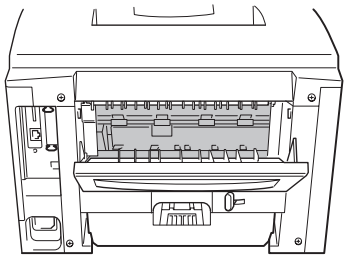
Warning

After you have just used the printer, some internal parts of the printer are extremely **HOT!** When you open the covers of the printer, never touch the shaded parts shown in the following illustrations.



Caution

After you have just used the printer, some internal parts of the printer are extremely **HOT!** Wait for the printer to cool down before you touch the internal parts of the printer.



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CHAPTER 1
ABOUT THIS PRINTER

What is included in the carton

Components

When you unpack the printer, check to see that you have all of the following parts.

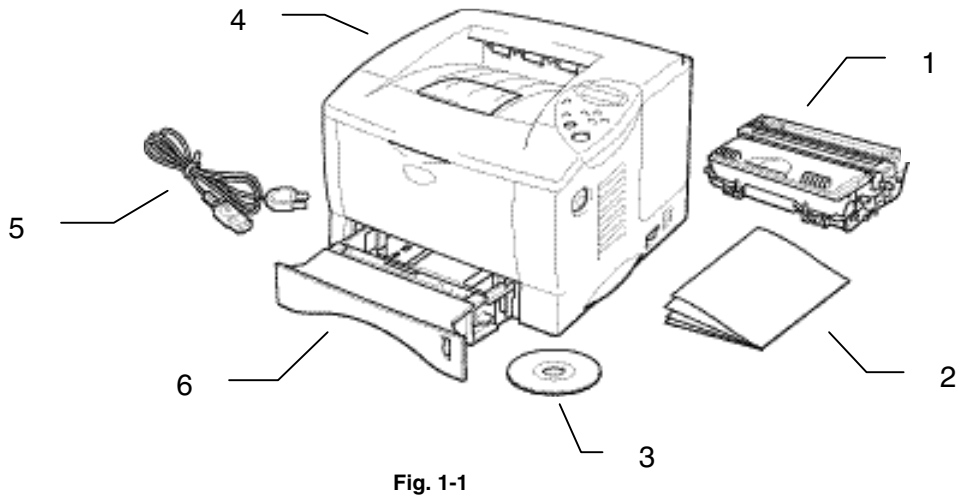


Fig. 1-1

1. Drum unit assembly (with Toner cartridge)
2. Documentation
3. CD-ROM
4. Printer
5. AC power cord
6. Paper cassette

Note

- An interface cable is not a standard accessory. Some computers have both a USB and a parallel port. Please purchase the appropriate cable for the interface you intend to use. Most existing parallel cables support bi-directional communication, but some might have an incompatible pin assignment or may not be IEEE 1284-compliant.
- Do not use a parallel cable that is longer than 3 metres (10 feet).
- The power cord may differ slightly from this figure depending on the country where you purchased the printer.
- When you use a USB cable, make sure to use a high speed twisted cable (12Mbps), and connect it to the USB connector of your PC. Do not use the USB connector on the front of your PC or on the iMac's keyboard)

❖ What is included on the CD-ROM (For Windows user)

1 Initial setup

See the setup process from hardware setup to driver installation on a video.

2 Install software

For general users

Printer driver (For more information, see Chapter 2)
Automatic E-mail Printing

For administrators

Network utility (For Administrator)

- BRAdmin Professional
- Network Printer Driver Wizard
- Network Print Software
- Storage Manager

3 Manual

User's Guide
Network guide
Technical Reviewer's Guide

4 Brother Solutions Center

Introduction to our user support web page. You can easily access it and receive the latest drivers and information for this printer.

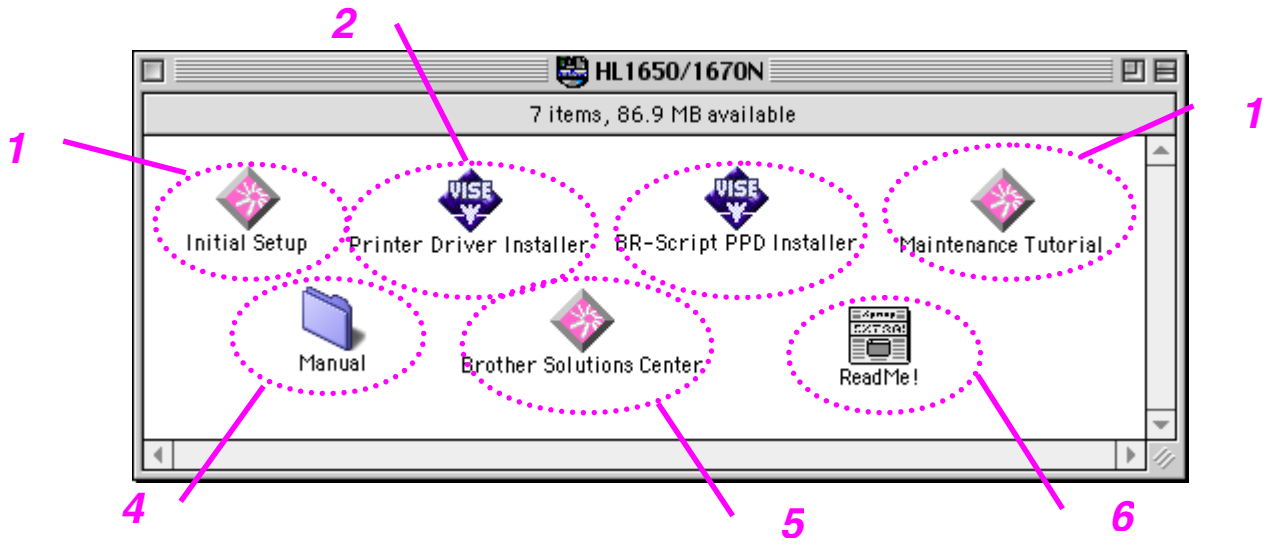
5 Maintenance Tutorial

See the maintenance videos for this printer. We recommend that you view the videos before getting started.

6 Make Disk sets

If you do not have a CD-ROM drive, copy the contents of the CD-ROM to floppy disks.

❖ What is included on the CD-ROM (For Macintosh users)



1 Initial setup & Maintenance Tutorial

See the maintenance operations required for this printer in the video movie. We recommend that you look at the video first before getting started.

2 Printer Driver Installer

For more information, See Chapter 2.

3 BR-Script PPD Installer

Printer driver (For more information, see Chapter 2)

This printer has support for Mac OS 8.51, 8.6, 9.0 and 9.04.

4 Manual

User's Guide
Network guide
Technical Reviewer's Guide

5 Brother Solutions Center

6 Read me

General View

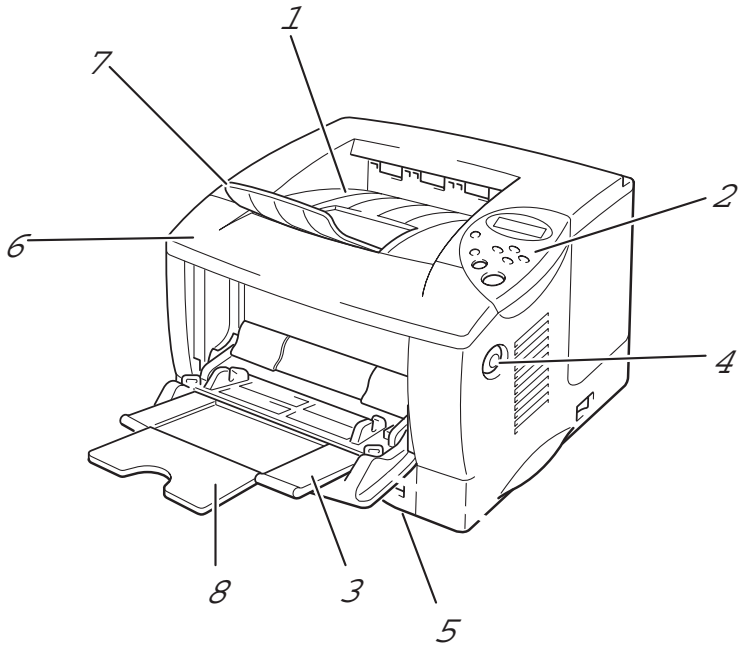


Fig. 1-2

1	Face down output tray
2	Control panel
3	Multi-purpose tray
4	Cover release button
5	Paper cassette
6	Front cover
7	Extension flap
8	Multi-purpose tray extension

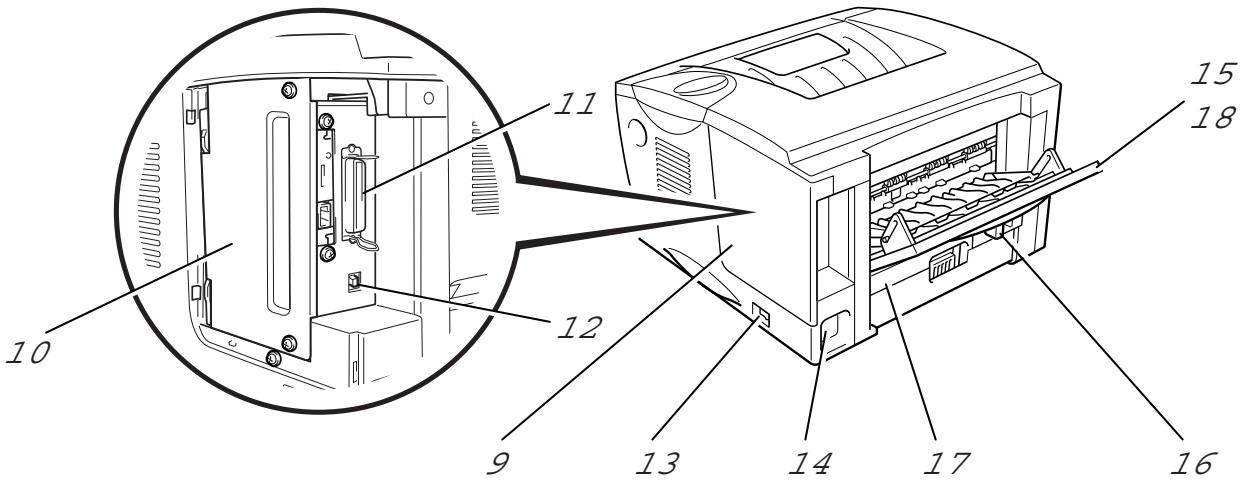


Fig. 1-3

9	Interface cover
10	PCB access plate
11	Parallel interface connector
12	USB connector
13	Power switch
14	AC power inlet
15	Face up output tray
16	Paper adjustment lever for duplex printing
17	Duplex tray
18	Face up tray extension

Positioning the printer

Please take note of the following before using the printer.

Power supply

Use the printer within the specified power range.

AC power:	AC 220-240 V or AC 100-120 V
Frequency:	50/60 Hz

The power cord, including extensions, should not exceed 5 metres (16.5 feet).

Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier, shredder, etc. If it is unavoidable that you must use the printer with these appliances, we recommend that you use a voltage transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

Use the printer only within the following ranges of temperature and humidity.

Ambient temperature:	10°C to 32.5°C (50°F to 90.5°F)
Ambient humidity:	20% to 80% (without condensation)

Do not block the air exit on top of the printer. Do not place objects on top of the printer, especially on the air vent.

Ventilate the room in which you use the printer.

Do not place the printer where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the printer from direct sunlight if the printer is unavoidably set up near a window.

Do not install the printer near devices that contain magnets or generate magnetic fields.

Do not subject the printer to strong physical shocks or vibrations. Do not expose the printer to open flames or salty or corrosive gasses.

Place the printer on a flat, horizontal surface.

Keep the printer clean. Do not install the printer in a dusty place.
Do not install the printer near an air conditioner.

Do not place the printer where the air vent of the printer can be obstructed. Keep a gap of approximately 100 mm (4 inches) between the air vent and the wall.

What kind of paper can I use?

Print media and size

The Paper trays and LCD panel descriptions in this manual are named as shown below.

Upper paper tray	Tray 1
Multi-purpose tray	MP tray
Optional Lower tray	Tray 2

The printer usually loads paper from the installed Multi-purpose tray, Upper paper tray or optional Lower paper tray.

Click the check mark in the following table to see the detailed information for each selection.

Media type	***Tray 1***	***MP tray***	***Tray 2***	***Duplex printing***	***Select the Media type from the printer driver***
Plain paper	✓	✓	✓	✓	Plain paper
Recycled paper	✓	✓	✓	✓	Plain paper
Bond paper		✓			Bond paper
Thick paper		✓			Thick paper or Thicker paper
Transparencies	✓ up to 10 sheets	✓ Only A4, Letter			Transparencies
Label		✓ Only A4, Letter			Plain paper
Envelopes		✓			Envelopes
Card stock		✓			Thick paper or Thicker paper

	Upper paper tray (Tray 1)	*Multi-purpose tray (MP tray)*	*Optional Lower tray unit (Tray 2)*	*Duplex printing*
Paper size	A4, Letter, Legal, 8.5 x 13 in., B5 (JIS), B5 (ISO), Executive, A5, A6, B6	Width: 70 to 216 mm (215 to 8.5 in.) Length: 116 to 356 mm (4.57 to 14.0 in.)	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5	A4, Letter, Legal
Capacity	250 sheets (80 g/m^2 or 21 lbs.)	100 sheets (80 g/m^2 or 21 lbs.) Legal : 30 8.5 x 13 in. : 30 labels : 10	250 sheets (80 g/m^2 or 21 lbs.)	

We recommend the following print methods (output tray) for each paper media type:

Media type	***Paper output***		***Notes***
	Face down	***Face up***	
Plain paper	✓	✓	60 g/m^2 to 105 g/m^2 (16 to 28 lbs.)
Thick paper		✓	105 g/m^2 to 161 g/m^2 (28 to 43 lbs.)
Recycled paper	✓	✓	
Transparencies	✓		OHP films
Label		✓	
Envelopes		✓	
Card stock		✓	

You can select the priority of the paper source in the Paper Menu on the Control Panel.
For more information about the paper settings, see Chapter 3.

Recommended paper

	Europe	USA
Plain paper	Xerox Premier 80 g/m^2	Xerox 4200DP 20 lb
	Xerox Business 80 g/m2	Champion Paper One 20 lb
	Modo DATACOPY 80 g/m2	Hammermill Laser Paper 24 lb
	IGEPA X-Press 80 g/m2	
Recycled paper	Steinbis Recycling Copy 80 g/m2	
Transparency	3M CG3300	3M CG 3300
Label	Avery laser label L7163	Avery laser label #5160

- *Before you purchase large quantities of paper, please test print a small quantity to ensure that the paper is suitable.*
- *Use paper designed for plain paper copying.*
- *Use paper that is 75 to 90 g/m^2.*
- *Use neutral paper; avoid acidic or alkaline paper.*
- *Use Long grain paper.*
- *Use paper with a moisture content of approximately 5%.*

❖ Printable area

The figure below shows the printable area.

Portrait

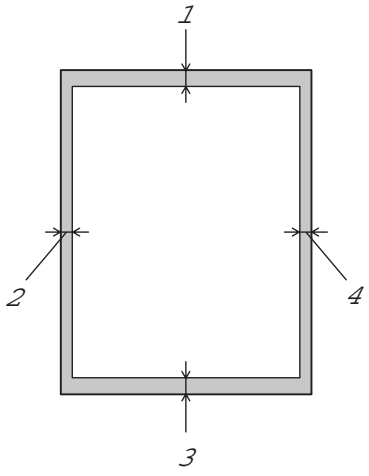


Fig. 1-4

	USA/Canada	*Europe/other countries*
1	0.17 inch (4.2 mm)	4.2 mm
2	0.25 inch (6.35 mm)	6.01 mm
3	0.17 inch (4.2 mm)	4.2 mm
4	0.25 inch (6.35 mm)	6.01 mm

Landscape

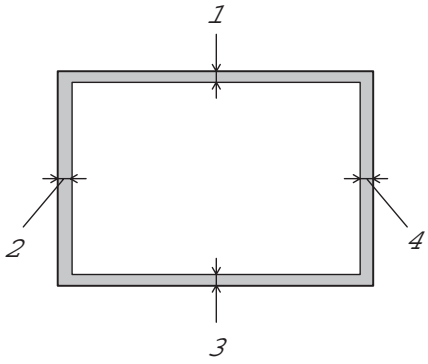


Fig. 1-5

	USA/Canada	*Europe/other countries*
1	0.17 inch (4.2 mm)	4.2 mm
2	0.2 inch (5.08 mm)	5.0 mm
3	0.17 inch (4.2 mm)	4.2 mm
4	0.2 inch (5.08 mm)	5.0 mm

Printing from the Paper cassette

☛ **1.** Pull the paper cassette out of the printer.

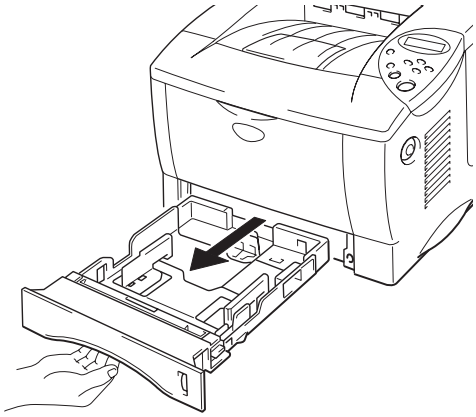


Fig. 1-6

☛ **2.** While pressing the paper guide release lever, slide the adjusters to fit the paper size. Check that they fit correctly into the slots.

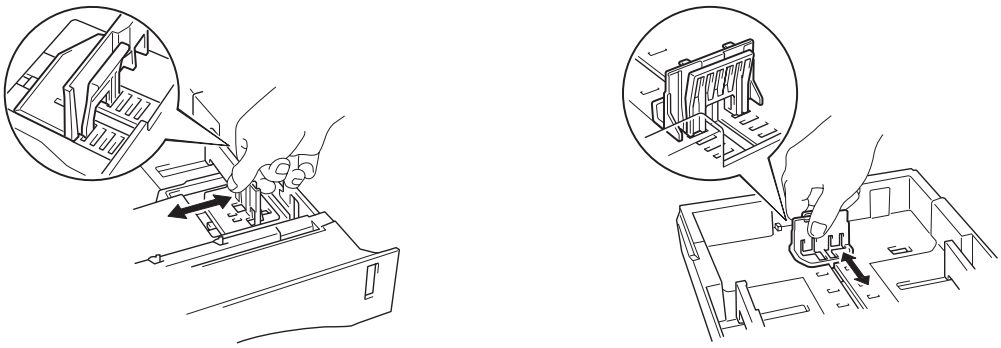


Fig. 1-7

For Legal or 8.5 x 13 in. paper
While pressing the Universal guide release lever, extend the rear of the Paper cassette.

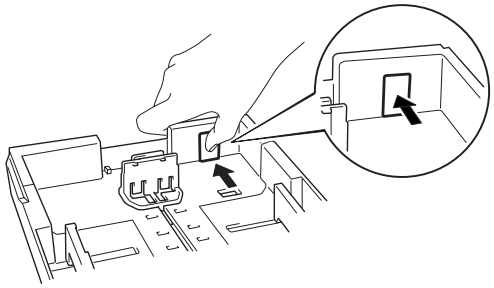


Fig. 1-8

☛ **3.** Load paper in the paper cassette. Check that the paper is flat and below the limit mark.

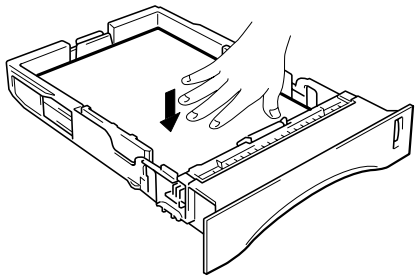
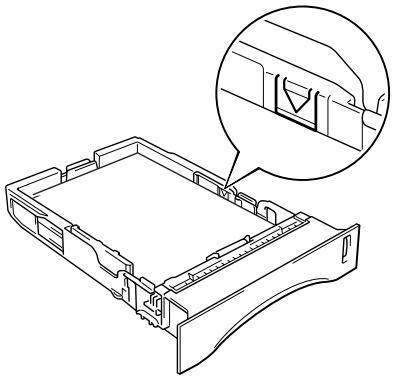


Fig. 1-9

Note

Do not load more than 250 sheets of paper (80 g/m^2 or 21 lb.) in the cassette or paper jams may occur. Paper can be loaded up to the lines on the sliding guide.



☛ **4.** Install the paper cassette into the printer.

Note

- Extend the Extension flap to prevent the paper from sliding off the face down output tray.
- If you choose not to extend the Extension flap, we recommend that you remove printed pages immediately after they exit the printer.

When you print on transparencies, use the Face down output tray.

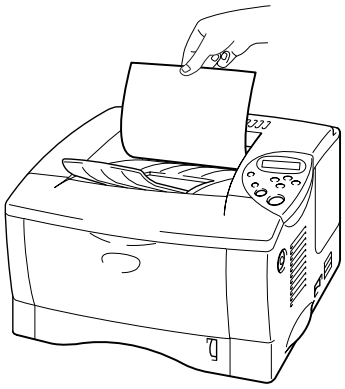
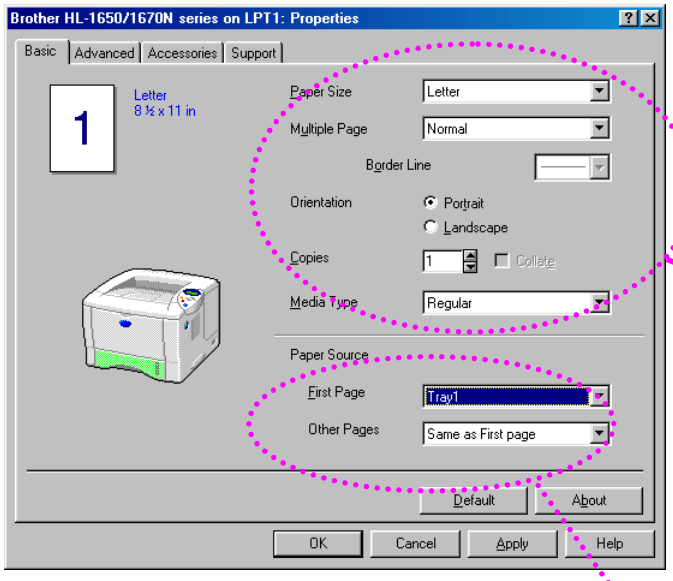


Fig. 1-10

☛ **5.** Change the following settings in the printer driver Properties tab.

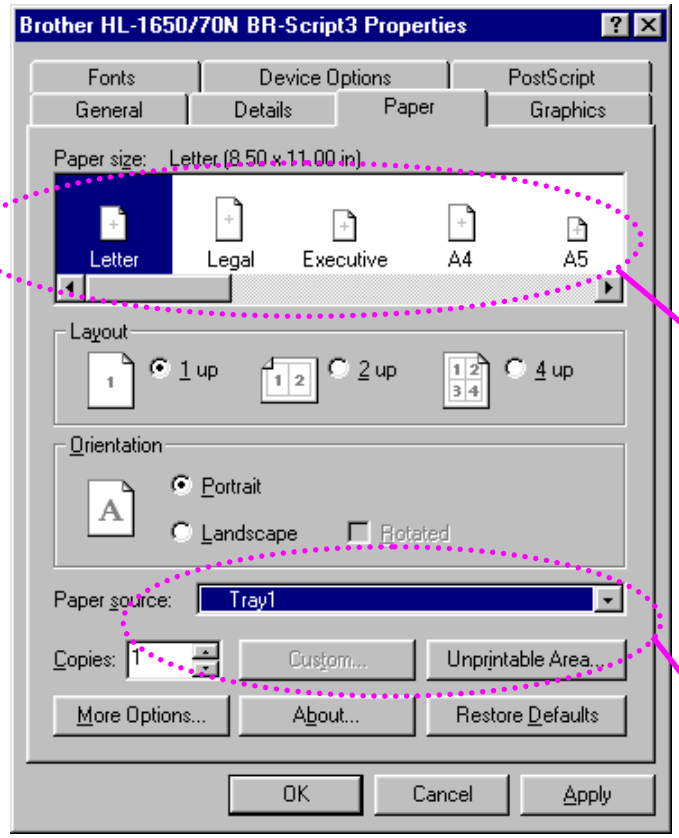
<PCL driver>



Select the paper size, media type etc.

Select the Paper source.

<PS driver>



Select the Paper size.

Select the Paper source etc.

Printing from the Multi-purpose tray

Note

- For correct printing, you must select the *same* paper size from within your software application as the paper in the tray.
- If your application software does not support paper size selection in its print menu, you can change the paper size on the printer's control panel under the PAPER menu. For more information, see Chapter 3.

1. Open the Multi-purpose tray.

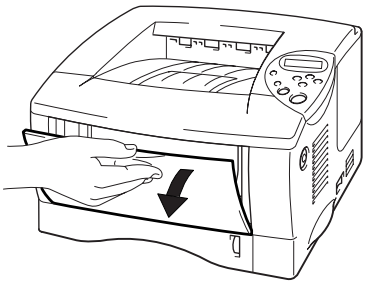


Fig. 1-11

2. Unfold the Multi-purpose tray extension.

Fig. 1-12

☛ **3.** Place paper in the Multi-purpose tray so it touches the back of the tray and remains below the limit mark.

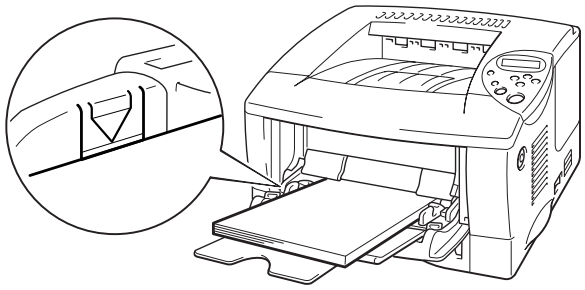


Fig. 1-13

Note

When you place paper on the Multi-purpose tray, note the following:

- If you will be printing on paper that weighs more than 135 g/m^2 (36 lbs), use the face up output tray.
- Insert the leading edge of the paper first and push it gently into the tray.
- If you use pre-printed paper in the Multi-purpose tray, the paper should be inserted top edge first with the printed side face up.

☛ **4.** Press and slide the paper width adjuster to fit the paper.

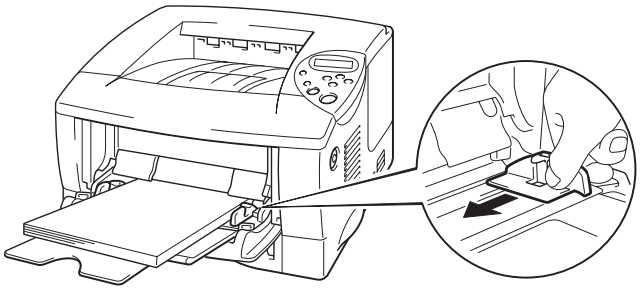


Fig. 1-14

Note

- Make sure neatly stacked paper is correctly seated in the Multi-purpose tray; otherwise paper may not be fed correctly, resulting in skewed printouts or paper jams.
- During printing, the inside tray automatically rises to feed paper into the printer.

☛ **5.** When you print on transparencies, use the Face down output tray.

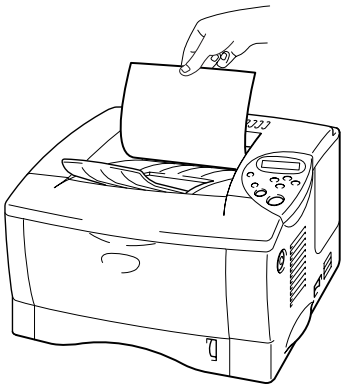
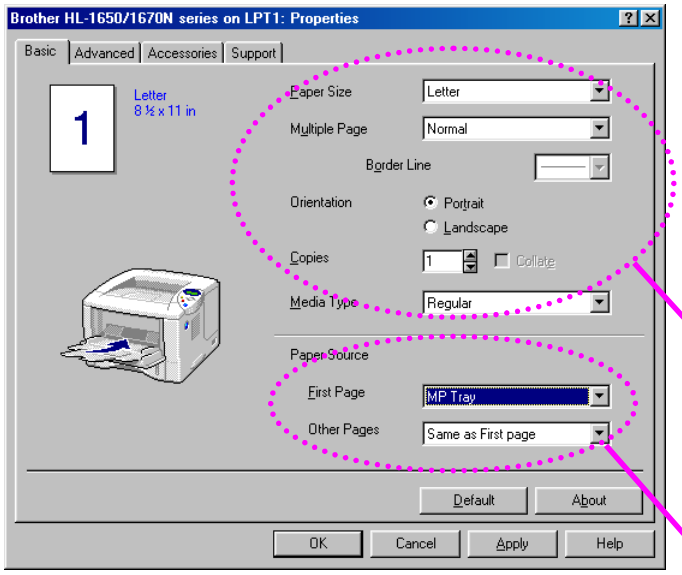


Fig. 1-15

☛ **6.** Change the following settings in the printer driver properties tab.

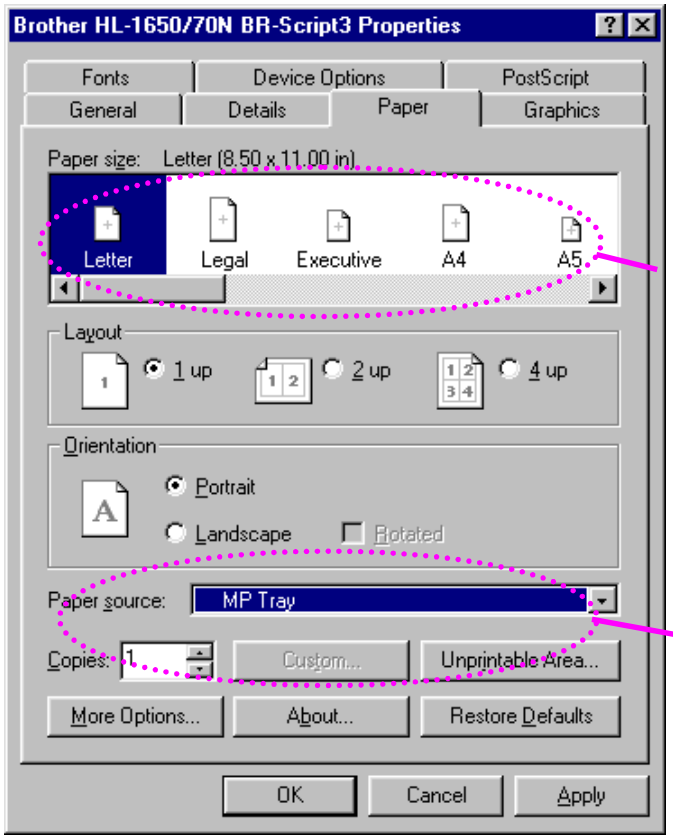
<PCL driver>



Select the paper size, media type etc.

Select the Paper source.

<PS driver>



Select the Paper size.

Select the Paper source etc.

Printing envelopes

Envelope types to avoid

- Envelopes that are damaged, curled, wrinkled, or irregularly shaped
- Envelopes that are extremely shiny or highly textured
- Envelopes with clasps, snaps or tie strings.
- Envelopes with self-adhesive closures
- Envelopes of baggy construction
- Envelopes that are not sharply creased
- Embossed envelopes
- Envelopes that were previously printed by a laser printer
- Envelopes that are pre-printed on the inside
- Envelopes that cannot be arranged uniformly when placed in a pile
- Envelopes constructed with paper that exceeds the paper weight specifications for the printer.
- Poorly manufactured envelopes with edges that are not straight or consistently square.
- Envelopes with transparent windows, holes, cutouts or perforations.

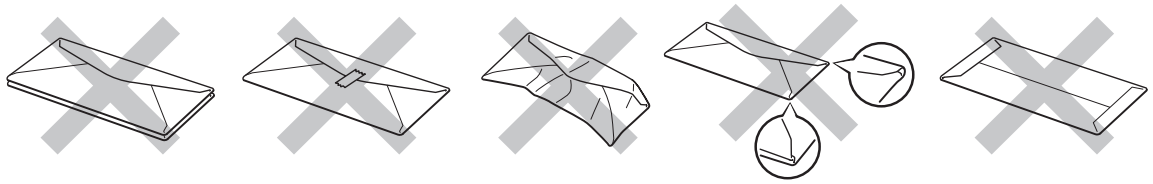
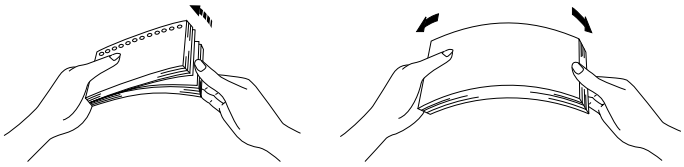


Fig. 1-16

USE OF THE ENVELOPE TYPES LISTED ABOVE MAY CAUSE DAMAGE TO YOUR PRINTER. SUCH DAMAGE IS NOT COVERED UNDER ANY WARRANTY OR SERVICE AGREEMENT.

Note

- Before printing envelopes, you must fan the stack of envelopes well to avoid paper jams and misfeeds.



- Do not load different types of paper at the same time in the paper cassette because paper jams and misfeeds may occur.
- Do not print envelopes using Duplex printing.
- For correct printing, you must select the *same* paper size from within your software application as the paper in the tray.
- If your application software does not support paper size selection in its print menu, you can change the paper size on the printer's control panel under the PAPER menu. For more information, see Chapter 3.

☛ **1.** Open the Multi-purpose tray.

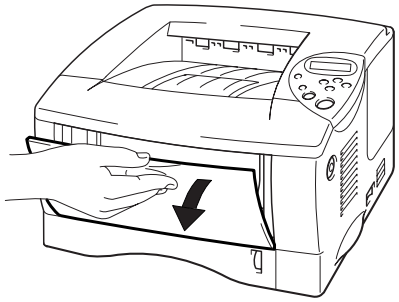


Fig. 1-17

☛ **2.** Unfold the Multi-purpose tray extension.

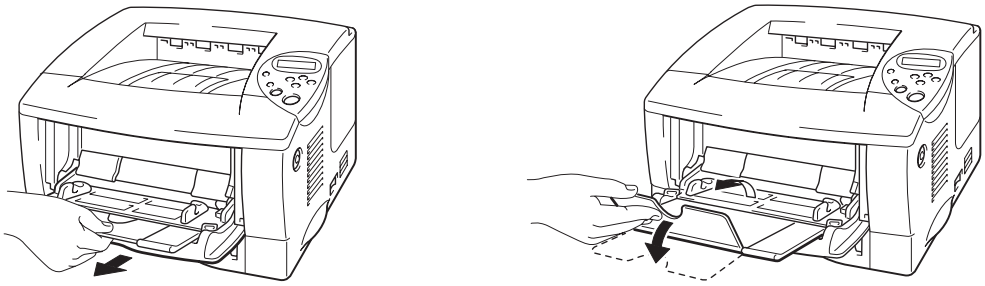


Fig. 1-18

☛ **3.** Open the Face up output tray.

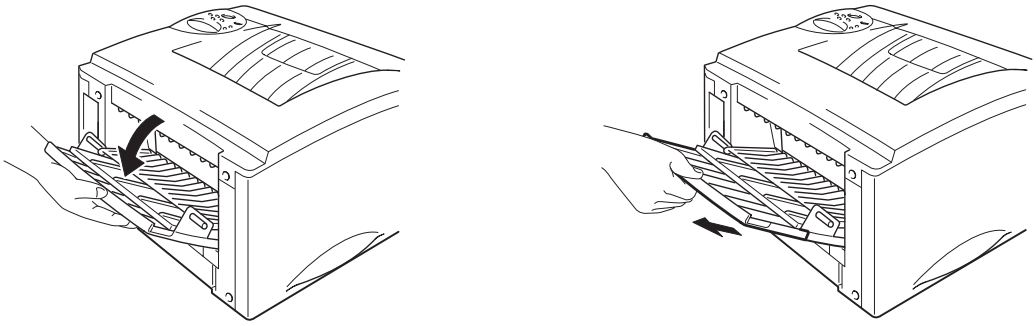


Fig. 1-19

☛ **4.** Place envelopes in the Multi-purpose tray so they touch the back of the tray and remain below the limit mark.

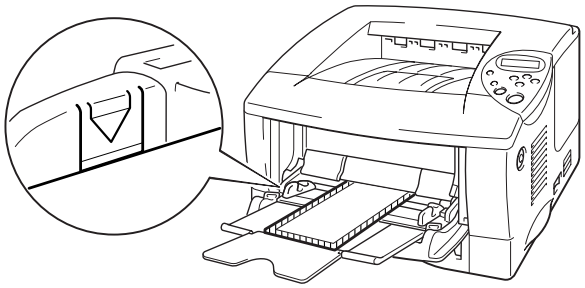


Fig. 1-20

Note

When you place paper in the Multi-purpose tray, note the following:

- If you will be printing on paper that weighs more than 135 g/m^2 (36 lbs), use the face up output tray.
- Insert the leading edge of the paper first and push it gently into the tray.
- The top of the paper stack must be under the guides that are on both sides of the tray. The maximum thickness is 11 mm (or 0.43 inch).
- The printed side must be face up.

☛ **5.** Press and slide the paper width adjuster to fit the envelope size.

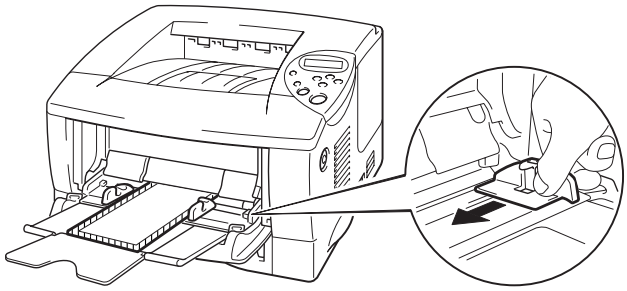


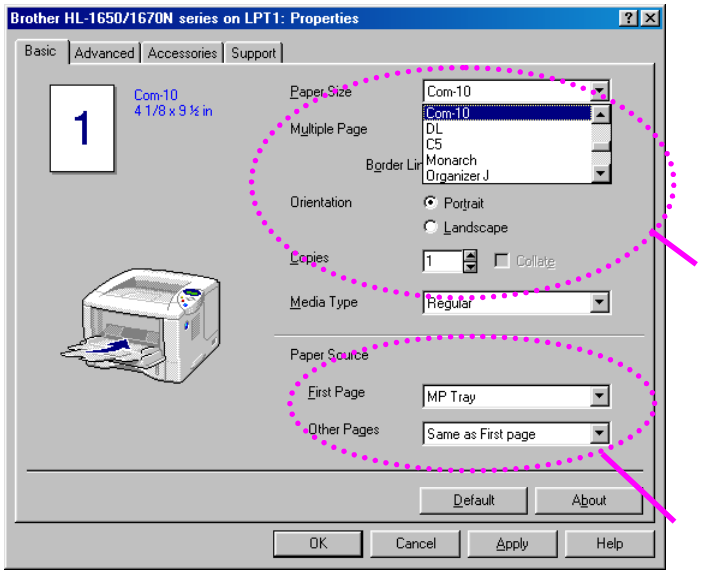
Fig. 1-21

Note

- Make sure that neatly stacked envelopes are correctly seated in the Multi-purpose tray otherwise envelopes may not be fed correctly, resulting in skewed printouts or paper jams.
- When printing, the inside tray automatically rises to feed envelopes into the printer.

☛ **6.** Change the following settings in the printer driver properties tab.

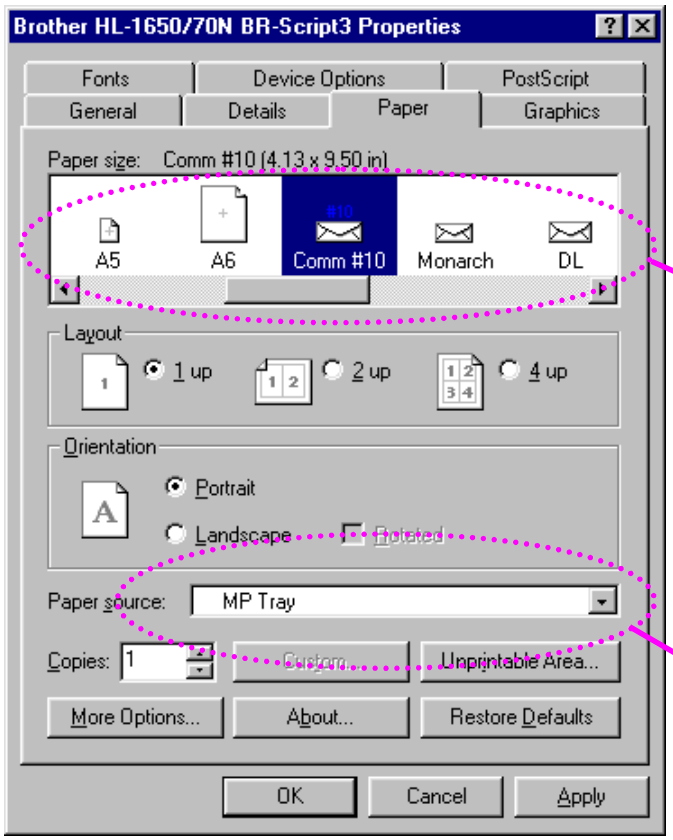
<PCL driver>



Select the envelope size, media type etc.

Select the Multi-purpose tray.

<PS driver>



Select the envelope size.

Select the Multi-purpose tray.

Printing on Labels, Transparencies etc.

Special paper types to avoid

- Damaged, curled, wrinkled, or irregularly shaped paper

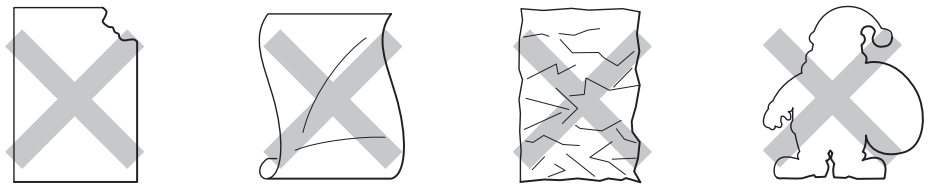


Fig. 1-22

Note

- Before using paper with holes, such as organizer sheets, you must fan the stack of paper well to avoid paper jams and misfeeds.

- Do not use paper with perforations at the edge.
- Do not place the punched holes of organizer sheets near the actuator (paper sensor).
- Do not use organizer sheets that are stuck together. The glue on them might cause damage to the printer.
- Do not load different types of paper at the same time in the paper cassette because it may cause paper jams or misfeeds.
- For correct printing, you must select the same paper size from within your software application as the paper in the tray.
- If your application software does not support paper size selection in its Print menu, you can change the paper size on the printer's control panel under the PAPER menu. For more information, see Chapter 3.

Warning

Do not touch transparencies that have just been printed because they are very **hot!**

☛ **1.** Open the Multi-purpose tray.

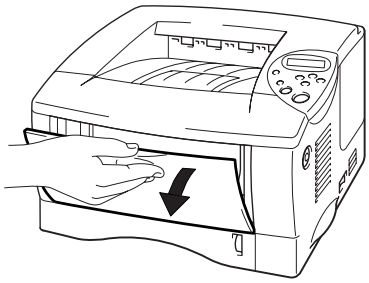


Fig. 1-23

☛ **2.** Unfold the Multi-purpose tray extension.

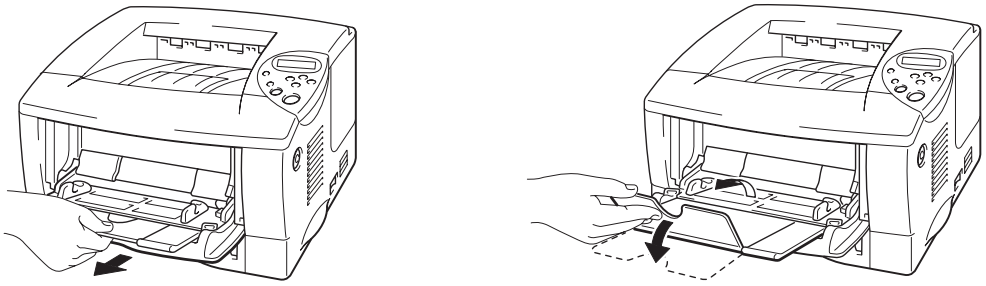


Fig. 1-24

When you use labels, open the Face up output tray.
When you use transparencies, print to the Face down output tray.

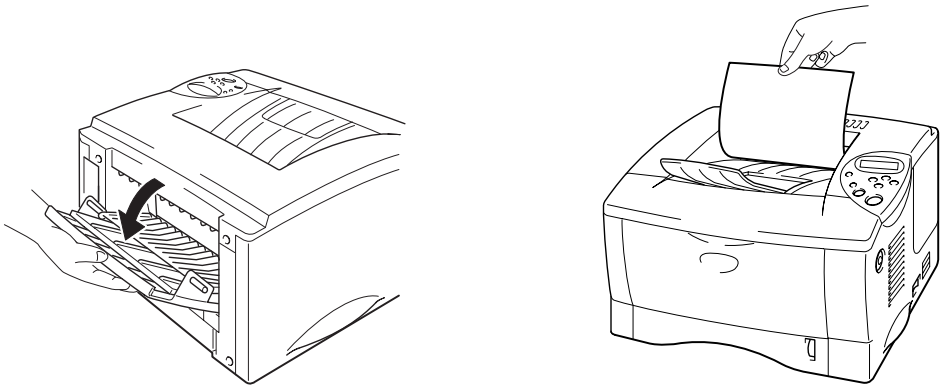


Fig. 1-25

☛ **3.** Place paper in the Multi-purpose tray so it touches the back of the tray and remains below the limit mark.

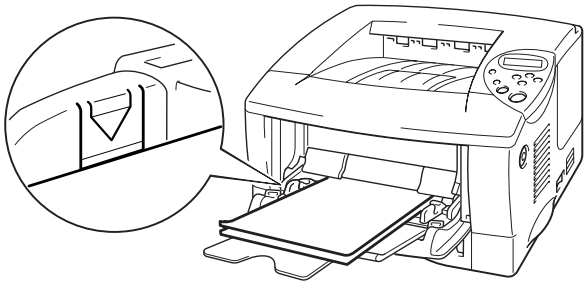


Fig. 1-26

Note

When you place paper in the Multi-purpose tray, note the following:

- If you will be printing on paper that weighs more than 135 g/m^2 (36 lbs), use the face up output tray.
- Insert the leading edge of the paper first and push it gently into the tray.
- The printed side must be face up.

☛ **4.** Press and slide the paper width adjuster to fit the paper.

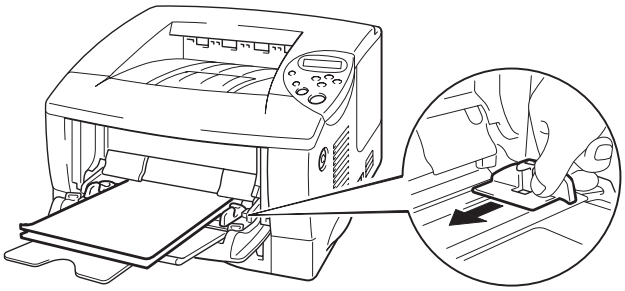
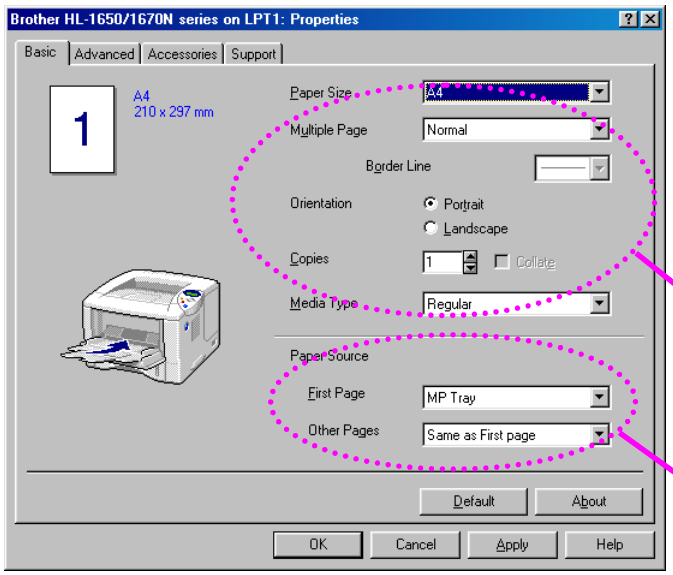


Fig. 1-27

☛ **5.** Change the following settings in the printer driver Properties tab.

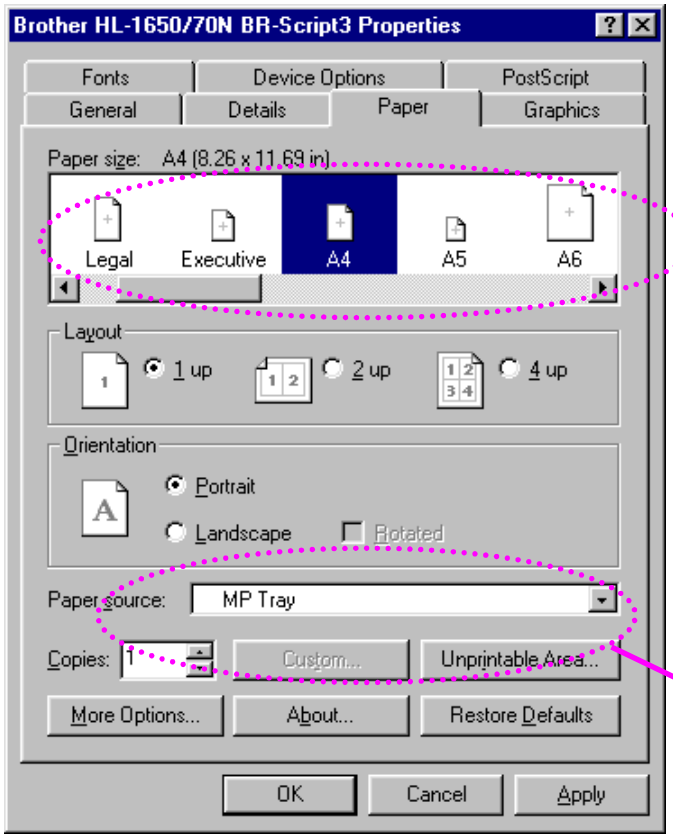
<PCL driver>



Select the envelope size, media type etc.

Select the Multi-purpose tray.

<PS driver>



Select the envelope size.

Select the Multi-purpose tray.

Printing to the Face up output tray (Face up printing)

When the Face up output tray is open, the printer has a straight paper path from the Paper cassette or Multi-purpose tray to the rear of the printer. Use this output method when you want to print on special media that is thick or should not be bent, such as heavy paper, labels, transparencies, card stock or envelopes.

☛ **1.** Open the Face up output tray.

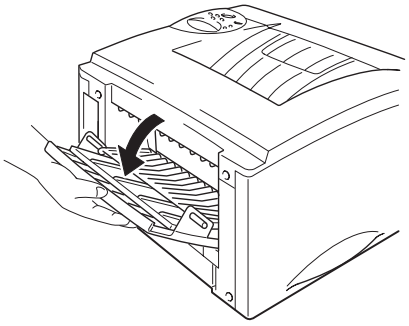


Fig. 1-28

☛ **2.** Unfold the Face up output tray extension.

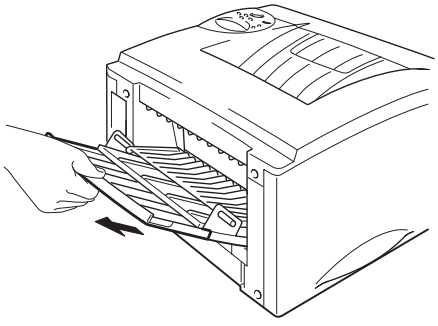


Fig. 1-29

☛ **3.** Place the paper into the Paper cassette or Multi-purpose tray.

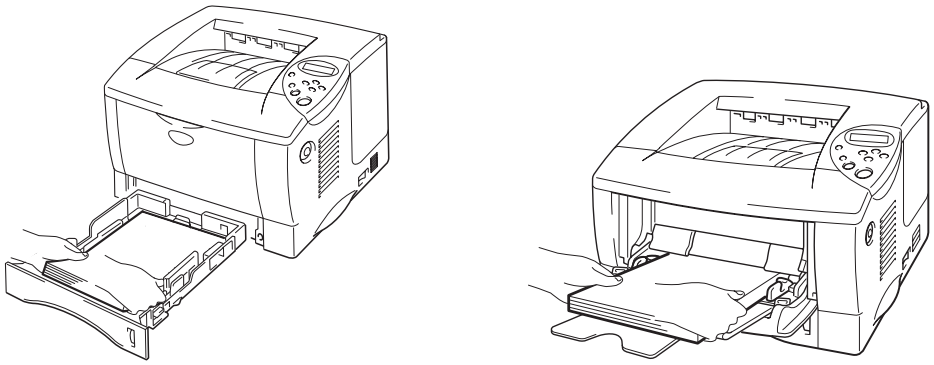


Fig. 1-30

☛ **4.** After the printer ejects all the printed pages, remove them and close the Face up output tray.

Printing on both sides of the paper (Duplex printing)

The supplied printer drivers for *Windows® 95 / 98 / Me, Windows NT® 4.0, Windows® 2000* supports automatic duplex printing.

Guidelines for printing on both sides of the paper

1 If the paper is thin, it may wrinkle.

2 If paper is curled, straighten it, and then place it in the paper cassette.

3 Use A4, Letter or Legal size plain paper (60 to 105 g/m^2 or 16 to 28 lb.). Do not use bond paper.

4 If the paper is not feeding correctly, it may be curled. Remove the paper and straighten it.

☛ **1.** Load paper into the Paper cassette or Multi-purpose tray.

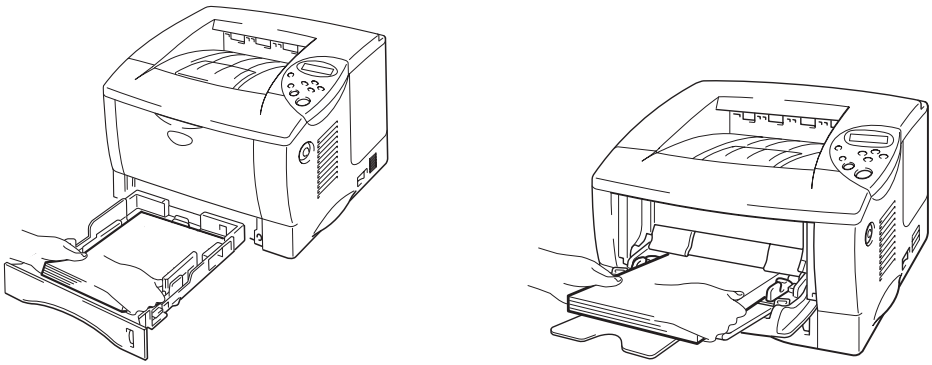


Fig. 1-31

☛ **2.** When you use A4 or Letter size paper, set the Paper adjustment lever for duplex printing to match your paper size.

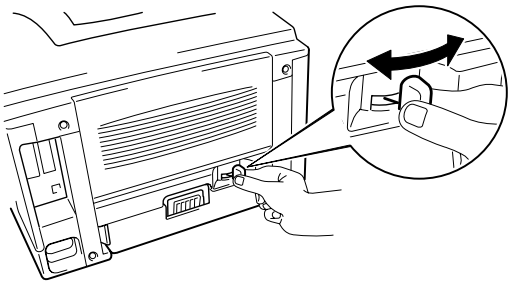


Fig. 1-32

Note

If the Paper adjustment lever for duplex printing is not correctly set for the paper size, paper jams may occur and the printing will be out of position on the paper.

☛ **3.** Open the Properties tab in the printer driver. Select the duplex printing mode in the Paper tab, and then click the OK button. The printer will print on both sides of the paper automatically.

Manual Feed

If you place paper in the Multi-purpose tray when the setting MANUAL FEED = ON has been set in PAPER mode using the control panel, the printer will load paper only from the Multi-purpose tray.

Note

When you feed paper manually, note the following:

- If your application software supports a manual feed selection in the Print menu, you can select it in that software. The software command setting overrides the Control panel's setting. You will not have to set MANUAL FEED and MP SIZE in PAPER mode.
- If you use pre-printed paper in the Multi-purpose tray, the paper should be inserted top edge first with the pre-printed side face up.

CHAPTER 2
DRIVER AND SOFTWARE

Printer Driver

A Printer Driver is software that translates data from the format used by a computer into the format required by a particular printer, which is typically done using a printer command language or page description language.

The printer drivers for the following operating systems are on the supplied CD-ROM. The latest printer driver can also be downloaded from the Brother Solutions Center at http://solutions.brother.com.

For Windows® 95/98/Me, Windows NT® 4.0 and Windows® 2000.

- PCL (Hewlett-Packard Laserjet laser printer) driver
- BR-Script (PostScript Level3 language emulation) driver

For Macintosh

- BR-Script (PostScript Level3 language emulation) driver (For more information, see the Network User's Guide on the CD-ROM.)
- USB printer driver for Macintosh

	PCL driver	PS driver
Windows 95/98/Me	✓	✓
Windows 2000	✓	✓
Windows NT4.0	✓	✓
Macintosh (via Network)		✓
Macintosh (via USB)	✓	

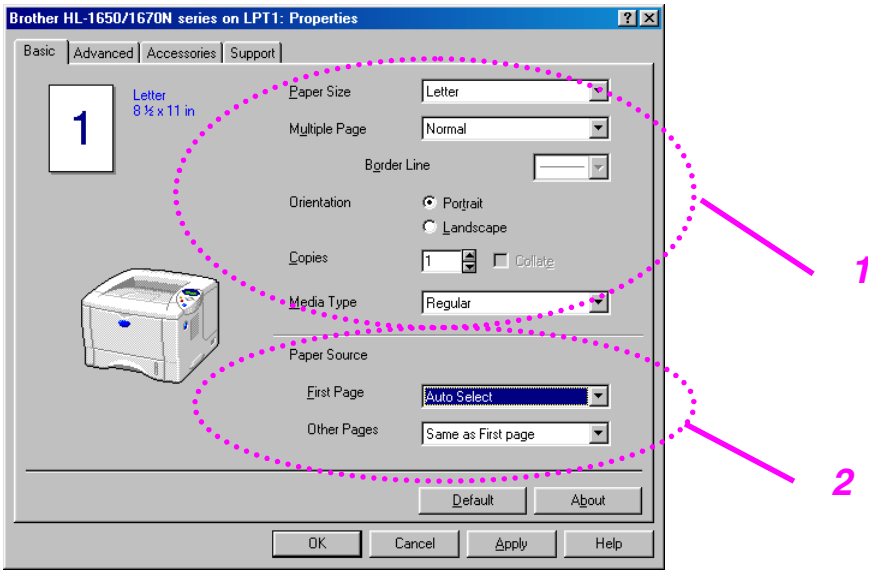
If you want to print from a DOS application, please see Chapter 6 of this manual.

Features in the PCL printer driver (Windows users only)

For more detailed information, please see the on-line Help in the printer driver.

You can also change settings by clicking the illustration on the left side of the tab screen.

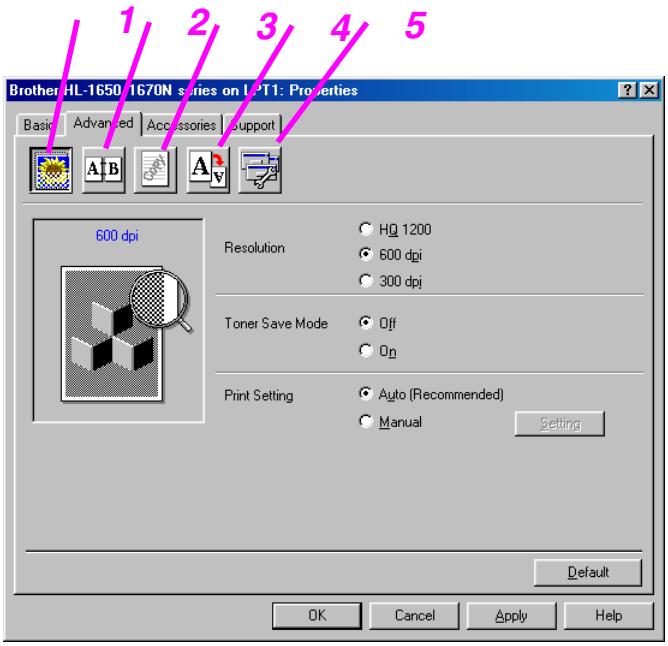
❖ Basic tab



1 Select the Paper size, Multi-page, Orientation etc..

2 Select the Paper source etc..

❖ *Advanced tab*



Change the tab settings by pressing these icons as follows:

1. Print Quality
2. Duplex
3. Watermark
4. Page Setting
5. Device Options

♦ *Print Quality*

Select the Resolution, Toner save and Print settings.

- You can change the resolution as follows:
  300 dpi
  600 dpi
  HQ1200: Brother HQ1200 technology provides the best print quality while printing at full engine speed.

- Toner Save
  You can save running costs by turning on the Toner Save mode, which reduces the printer density.

- With the Print setting set to MANUAL, you can change the Brightness, Contrast, Graphics mode settings and TrueType mode options manually.

♦ *Duplex*

This printer has a Duplex printing function as standard. If you select the duplex button, the dialogue box for making duplex settings appears. Six types of duplex binding directions are available for each orientation.

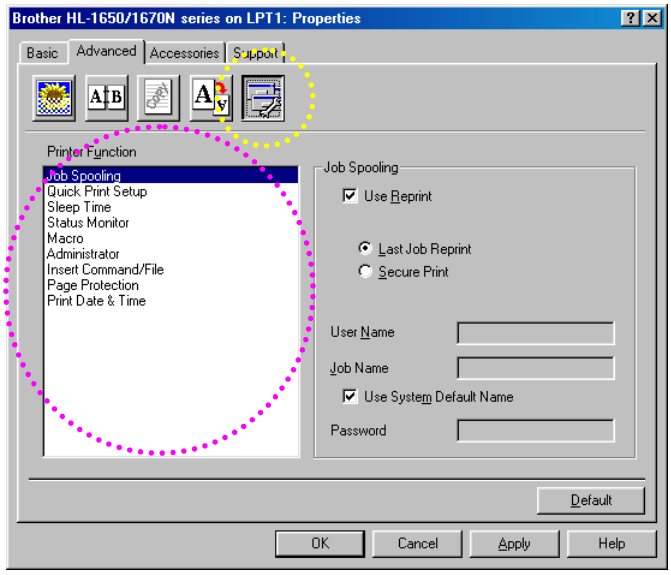
♦ *Watermark*

You can place a watermarked logo or text into your documents.
When you use a bitmap file as a watermark, you can change the size of the watermark and place it anywhere you like on the page.
When you use text as a watermark, you can change the font, darkness and angle settings.

♦ *Page Setting*

Change the print image scaling and select Mirror / Reverse print options.

♦ *Device Options*



Set the following print function modes in this tab.

Job Spooling
Quick Print Setup
Sleep Time
Status Monitor
Macro
Administrator
Insert Command File
Page Protection
Print Date & Time

Job Spooling

You can reprint a document without sending the data again (you will need to send the password again if one is set) from your PC because the printer will save data that you specify for reprinting.

- Last job reprint : Reprint the last job
- Secure Print : Print the data with a password

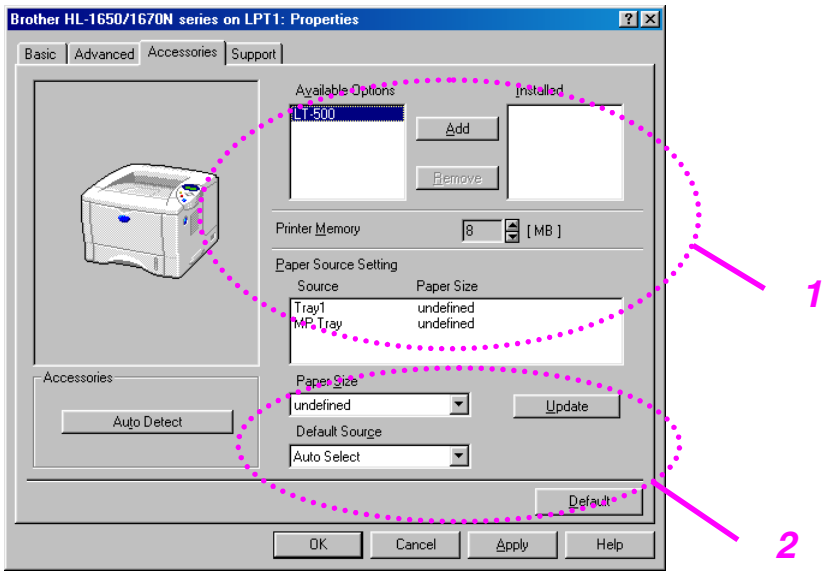
For more information about the reprint function, see “REPRINT switch” in Chapter 3.

Note

If you want to prevent other people from printing your own data using the reprint function, remove the Use Reprint check mark in Job Spooling settings.

❖ Accessories

When you install options, add those options and make settings for them in the Accessories tab as follows.



1 You can add and remove the options manually or automatically.

Automatic Printer Options Detection

This function detects the current optional unit devices automatically and the available functions are reflected in the printer driver.

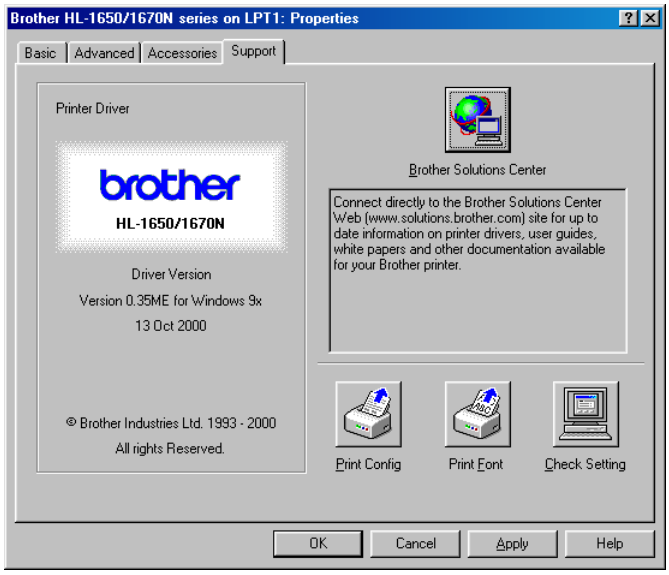
When you press “Auto Detect”, options that are installed on the printer will be listed. You can manually add or delete options. Tray and other settings will match the installed options.

2 Paper Source Setting

This feature recognizes the paper size in each paper tray automatically.

❖ *Support tab*

- You can download the latest driver by accessing the Brother Solutions Center at http://solutions.brother.com.
- You can see the printer driver version.
- You can check the current driver settings.
- You can print the Configuration page, Test page, etc..

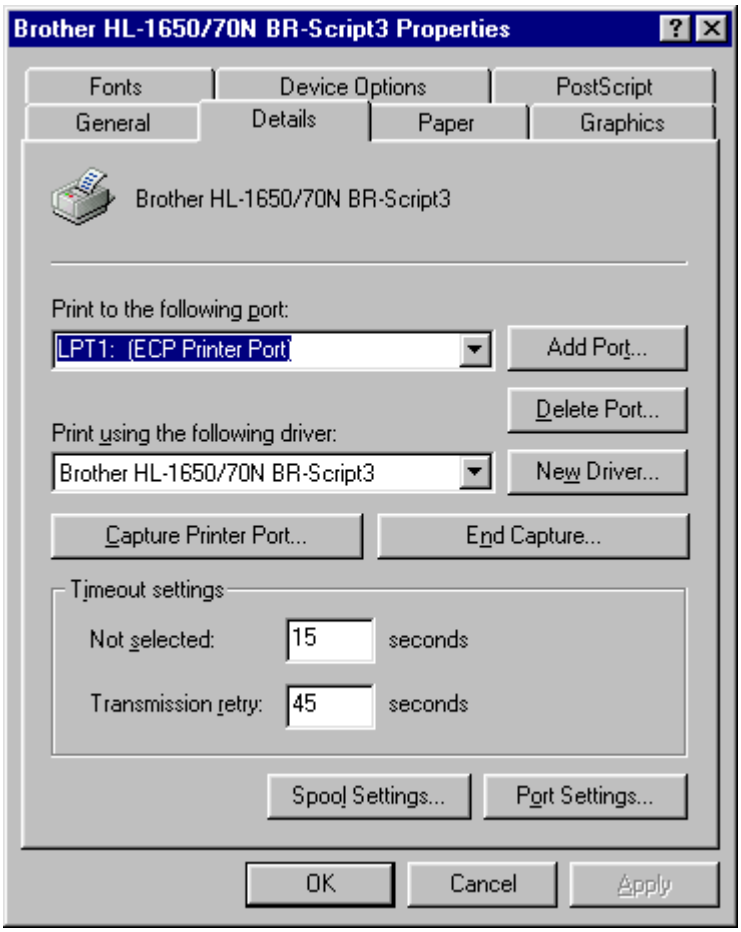


Features in the PS printer driver (Windows users only)

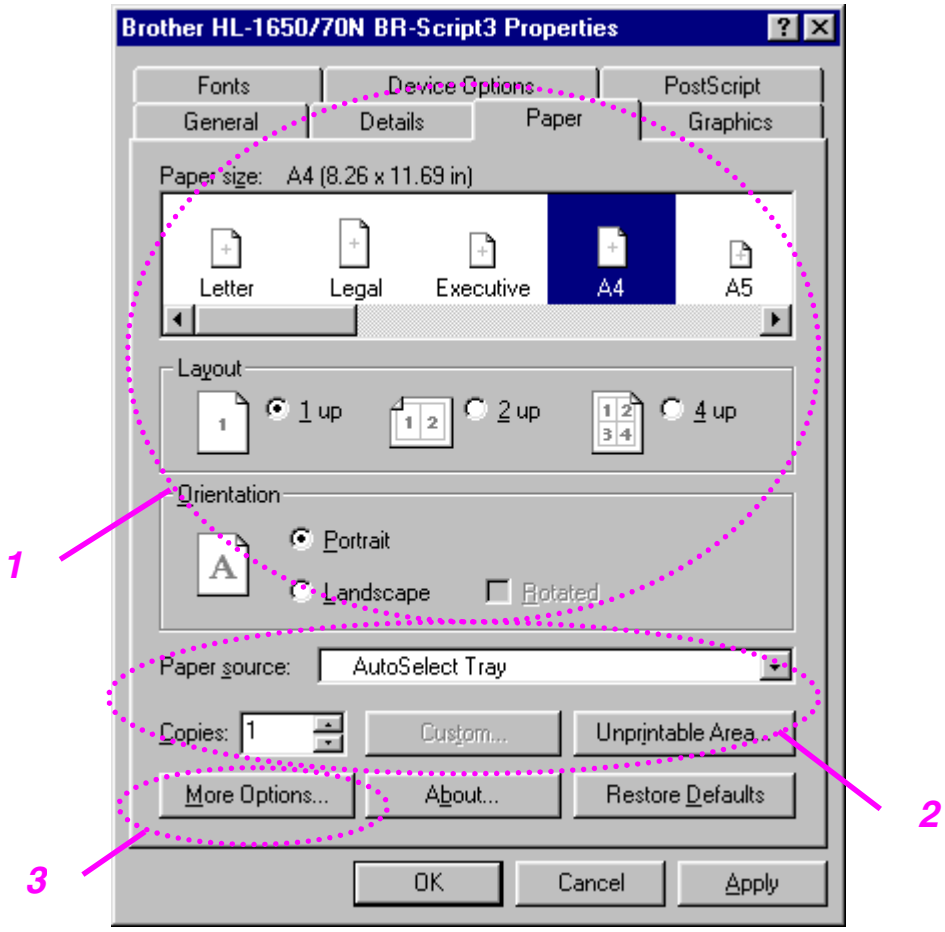
For more detailed information, please see the on-line Help in the printer driver.

❖ Details tab

Select the port where your printer is connected or the path to the network printer you are using.
Select the printer driver that you installed.



❖ *Paper tab*



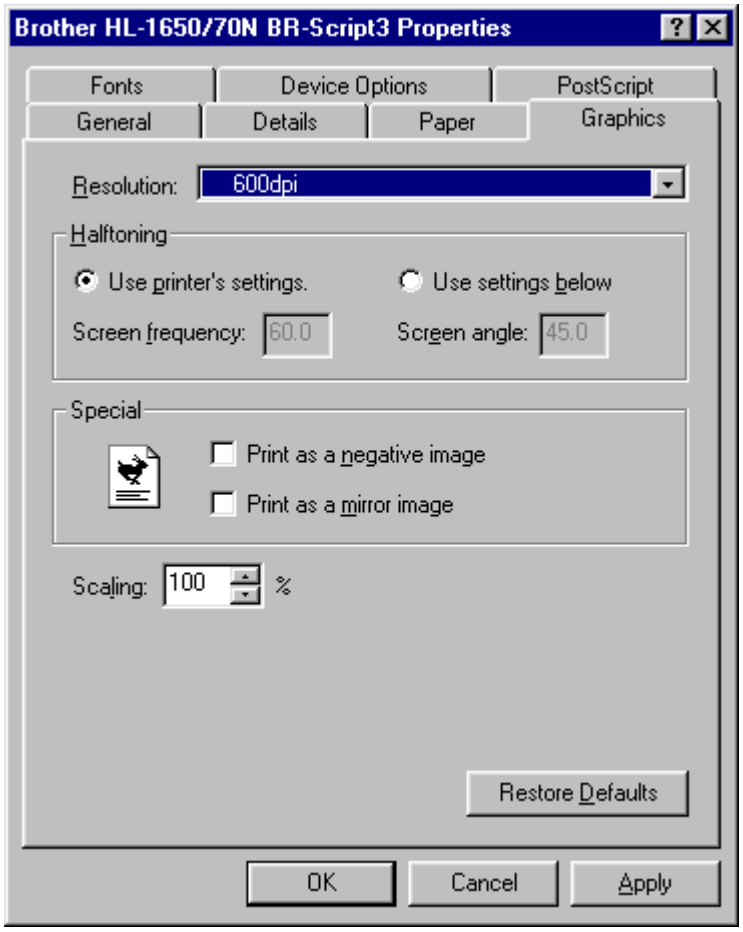
1 Select the Paper size, Multi-page, Orientation, etc..

2 Select the Paper source.

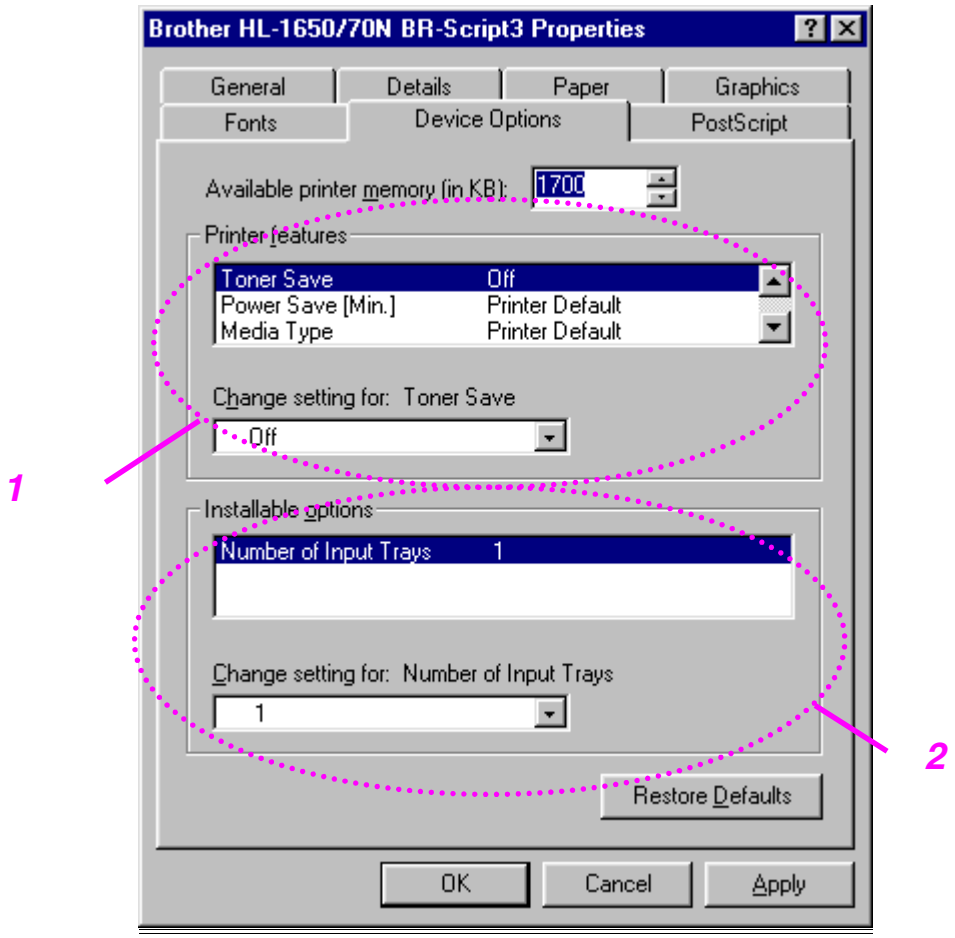
3 Select the Duplex function.

❖ Graphics

Set the print quality, etc..



❖ Device Options



1 You can change settings by clicking the setting and then selecting a new value in the Change Settings box.

Toner Save Mode
Sleep Mode
Media Type
HRC setting
Job spooling (You need to set the RAM Disk size first. For more information, see Chapter 3.)

2 Select the installed options from the list.

♦ *Job Spooling*

You can print a document without sending the data again (except Secure printing) from your PC because the printer will save data that you specify for reprinting.

For more information, see Chapter 3.

- Secure Print : Print the data with a password

Features in the bonus software (Windows users only)

♦ Automatic E-mail Printing

Automatic E-mail printing is used to download e-mail automatically, receive mail at the selected time and print it automatically. You can also set it to select the mail to be printed automatically depending on the sender and the subject of the e-mail.

Search e-mail by the sender and the subject and auto print

As soon as an e-mail is received, the printer prints it automatically without your having to start the print operation. You can also choose the mail you want to print by having the printer search by sender and subject.

Auto access at the selected time

You can check incoming e-mail by accessing the server at the time you set.

Several mail users can share a PC

Usually, it is difficult to share e-mail software between several people on one PC. Automatic E-mail Printing supports multi-users, so several people can use e-mail software on one PC.

You can keep your current e-mail software.

Even if you use Netscape or Microsoft Internet Mail, you can use Automatic E-mail Printing and get additional functions not supplied in the original e-mail software.

Software for networks

♦ BRAdmin professional

BRAdmin professional is a utility for managing your Brother network enabled printers which are running under Windows 95/98/Me, Windows 2000 and Windows NT 4.0 and allows you to easily configure and check the status of your network enabled printer.

♦ Storage Manager

Brother Storage Manager software can manipulate the printer forms that you may have stored in the internal flash memory.
You can print the fixed form document at any time by operating the control panel.
To make the fixed document to print, you must first write Fonts, Macros or fixed forms to the memory of your printer.

♦ *Network Printer Driver Wizard*

This installer includes the Windows PCL driver and Brother network port driver (LPR and NetBIOS). The administrator should set up the IP address, Gateway, Subnet without BRAdmin Professional before using this software. If the administrator then installs the printer driver and port driver using this software, he can save the file to the File server or send the file via E-mail to users. Then, users just click that file and the printer driver, port driver and IP address, etc., is automatically copied to their PC.

Software installation for Windows computers

You can install the Software from the supplied CD-ROM as follows:

☛ **1.** Insert the CD-ROM into the CD-ROM drive. The opening screen appears automatically.

If the screen does not appear, click Start and choose Run, enter the CD - drive letter and type \START.EXE (for example: D:\START.EXE).

☛ **2.** Select the LANGUAGE, and then follow the on-screen instructions. The printer driver will complete the installation.

Software installation for Macintosh computers

This printer supports Mac OS versions 8.51, 8.6, 9.0 and 9.04.

❖ Apple LaserWriter 8 Driver

The Apple LaserWriter Driver may have been installed with your system. It is also available at http://www.apple.com.
LaserWriter 8 versions 8.6 and 8.7 have been tested for use with this printer.

❖ PostScript Printer Description Files (PPDs)

PPDs, in combination with the Apple LaserWriter 8 Driver, access the printer features and allow the computer to communicate with the printer.
An installation program for the PPDs (“BR-Script PPD Installer”) is provided on the CD-ROM.

❖ Installing the printer driver for Macintosh

<For Network users with the PS driver>

☛ **1.** Turn on your Macintosh computer. Insert the CD-ROM into the CD-ROM drive. The following window will appear automatically.

☛ **2.** To install the BR-Script PPD file, click this icon.

☛ **3.** To set up the LaserWriter driver, refer to the Network User's Guide.

<For USB users with the PCL driver>

☛ **1.** Turn on your Macintosh computer. Insert the CD-ROM into the CD-ROM drive. The following window will appear automatically.

☛ **2.** Double click the Printer Driver Installer icon and then follow the instructions on the screen.

☛ **3.** Connect the USB interface cable to your Macintosh, and then connect it to the printer.

☛ **4.** Open the Chooser from the Apple Menu on the Macintosh, and click the Brother HL-1650/1670N icon and highlight it.

Automatic Emulation Selection

This printer has an Automatic emulation selection function. When the printer receives data from the computer, it automatically selects the emulation mode. This function has been factory set to ON.

The printer can select among the following emulation combinations:

EPSON (default)	***IBM***
HP LaserJet	HP LaserJet
BR-Script 3	BR-Script 3
EPSON FX-850	IBM Proprinter XL

You can select the emulation mode manually in the EMULATION menu in SETUP mode by using the control panel. For more information, see Chapter 3.

Note

When you use the Automatic emulation selection, note the following:

- The EPSON or IBM emulation mode priority must be selected, because the printer cannot distinguish between them. Since the factory setting is the EPSON emulation mode, to use the IBM emulation mode you may need to select it in the EMULATION menu in SETUP mode using the control panel.
- Try this function with your application software or network server. If the function does not work properly, either select the required emulation mode manually using the printer panel switches or use the emulation selection commands from your software.

Automatic Interface Selection

This printer has an Automatic interface selection function. When the printer receives data from the computer, it automatically selects the interface that is appropriate.

When you use the parallel interface, you can turn the high-speed and bi-directional parallel communications on or off in the Parallel menu in INTERFACE mode using the control panel. For more information, see Chapter 3. Since the automatic interface selection mode has been factory set to ON, simply connect the interface cable to the printer.

If a Network board (Brother NC-4100h) has been installed, select NETWORK mode by using the control panel.

If you constantly use only one interface, we recommend that you select that interface in the interface mode. The printer allocates all of the input buffer to that interface if only one interface is selected.

Printer Settings

Factory settings

The printer settings have been set at the factory before shipment. They are called “Factory settings.” Although you can operate the printer with these factory settings unchanged, you can tailor the printer with user settings. Please see “List of Factory settings” in Chapter 3.

Note

Changing the user settings does not affect factory settings. You cannot modify the preset factory settings.

The changed user settings can be restored to the factory default settings with the RESET MENU mode. For more information, see Chapter 3.

CHAPTER 3
CONTROL PANEL

Control panel

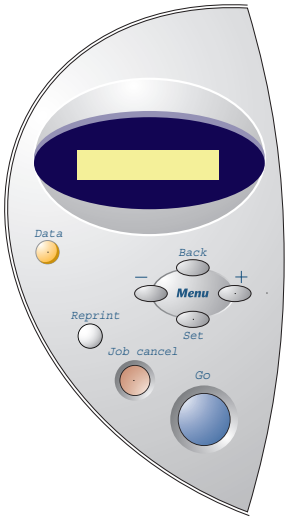


Fig. 3-1

Switches

You can control the basic printer operations and change various printer settings with 7 Control panel switches (**Go, Job Cancel**, **Reprint**, **+**, **–**, **Set**, **Back**).

	Key	Function
1	**Go**	Exit from the Control panel menu, Reprint settings and Error messages. Pause / Continue printing.
2	**Job Cancel**	Stop and cancel the printer operation in progress.
3	**Reprint**	Select the Reprint menu.
4	**+**	Move forward and backward through Menus.
	-	Move forward and backward through selectable options.
5	**Set**	Select the Control panel menu. Set the selected menus and settings.
6	**Back**	Go back one level in the menu structure.

Go switch

The panel indications can be changed from the current status (MENU, ERROR and REPRINT settings) by pressing the **Go** switch once. For ERROR indications, the panel changes only when the error is cleared.

You can PAUSE printing with the **Go** switch. Pressing the **Go** switch again restarts the print job and clears the PAUSE. During PAUSE, the printer is in the off-line state.

Note

If you do not wish to print the remaining data when the printer is in PAUSE, you can cancel the job by pressing the **Job Cancel** switch. Press the **Go** switch to clear the PAUSE and return the printer to the “Ready” state.

Job Cancel switch

You can cancel the processing or printing of data with the **Job Cancel** switch. The display shows "JOB CANCELLING" until cancelling is completed. After cancelling the job, the printer returns to the "READY" state.

When the printer is in any state except receiving data or printing, the display shows "NO DATA!!!" and you cannot cancel the job.

Reprint switch

If you want to reprint a document that has just been printed, you can reprint it by pressing the **Reprint** switch. Also, if you have created a document that you wish to share with colleagues, simply spool the document to a non-secure area of the printer. This document can then be re-printed by anyone who is on the network or at the printer Control panel.

You can use the reprint function when the printer is `READY` or in the Settings menu.

When you want to print SECURE data, we recommend RAM enhancement to enable the reprint using the RAM function.

When you use RAM to reprint;

☛ **1.** Press the **Set** switch on the Control panel to exit from the READY status and select RAMDISK SIZE in the SETUP mode.

☛ **2.** The default RAM size is 0MB. Press the **+** switch to increase the reprint RAM size in 1MB steps.

Note

When you increase the RAM size for secure printing, the work area of the printer is decreased and the printer performance will be reduced. When you store the data in RAM, the data will be deleted when the printer power is turned off.

We also recommend adding additional RAM when you want to be able to print a large amount of secure data. (See RAM expansion in Chapter 4.)

❖ Reprinting the last JOB

You can reprint the last print job without sending it from the computer again.

Note

- When REPRINT is set to Off using the control panel and you press the **Reprint** switch, the LCD briefly shows "NO DATA STORED."
- If you want to cancel reprinting, press the **Job Cancel** switch.
- If the printer does not have enough memory to spool the print job, it prints only the last page.
- Pressing the **–** or **+** switch makes the number or reprint copies decrease or increase. You can select between COPIES= 1 and COPIES=999.

For more information about the settings in the printer driver, see "Job Spooling" in Chapter 2.

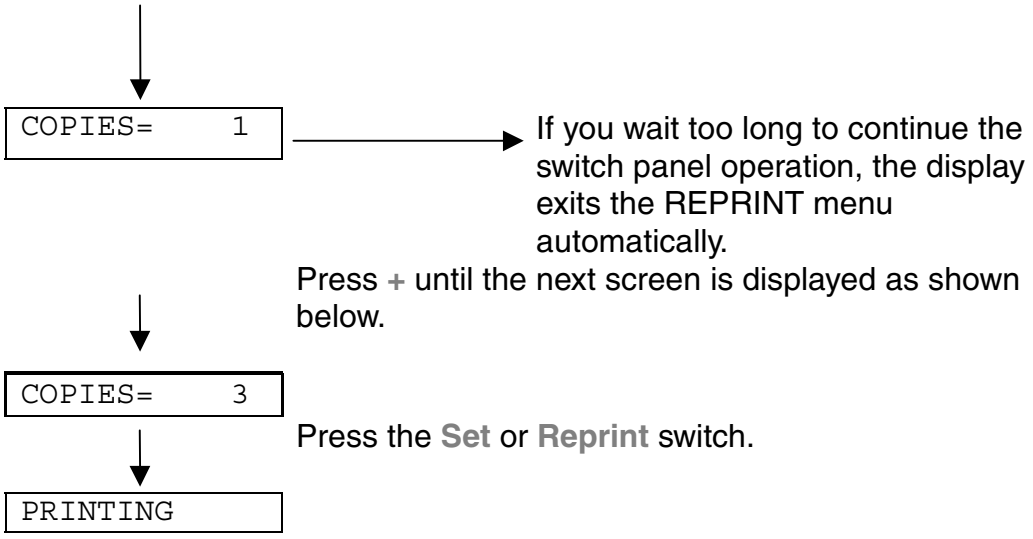
♦ *Reprint the last JOB 3 times*

☛ **1.** Set the REPRINT menu ON with SETUP mode using the Control panel.

Note

If you print using this printer's own driver, the settings for Job Spooling in the printer driver will take priority over the settings made in the Control panel. For more information, see "Job Spooling" in Chapter 2.

☛ **2.** Press the **Reprint** switch.



Note

If you want to reprint the data and have pressed the **Go** switch, the display shows "PRESS SET TO PRINT". Press **Set** to start the reprint job or press the **Go** switch to cancel the reprint job.

❖ Printing SECURE data

Secure documents are password protected and only those people that know the password will be able to print the document. The printer will not print the document when you send it for printing; to print the document you must use the control panel of the printer.

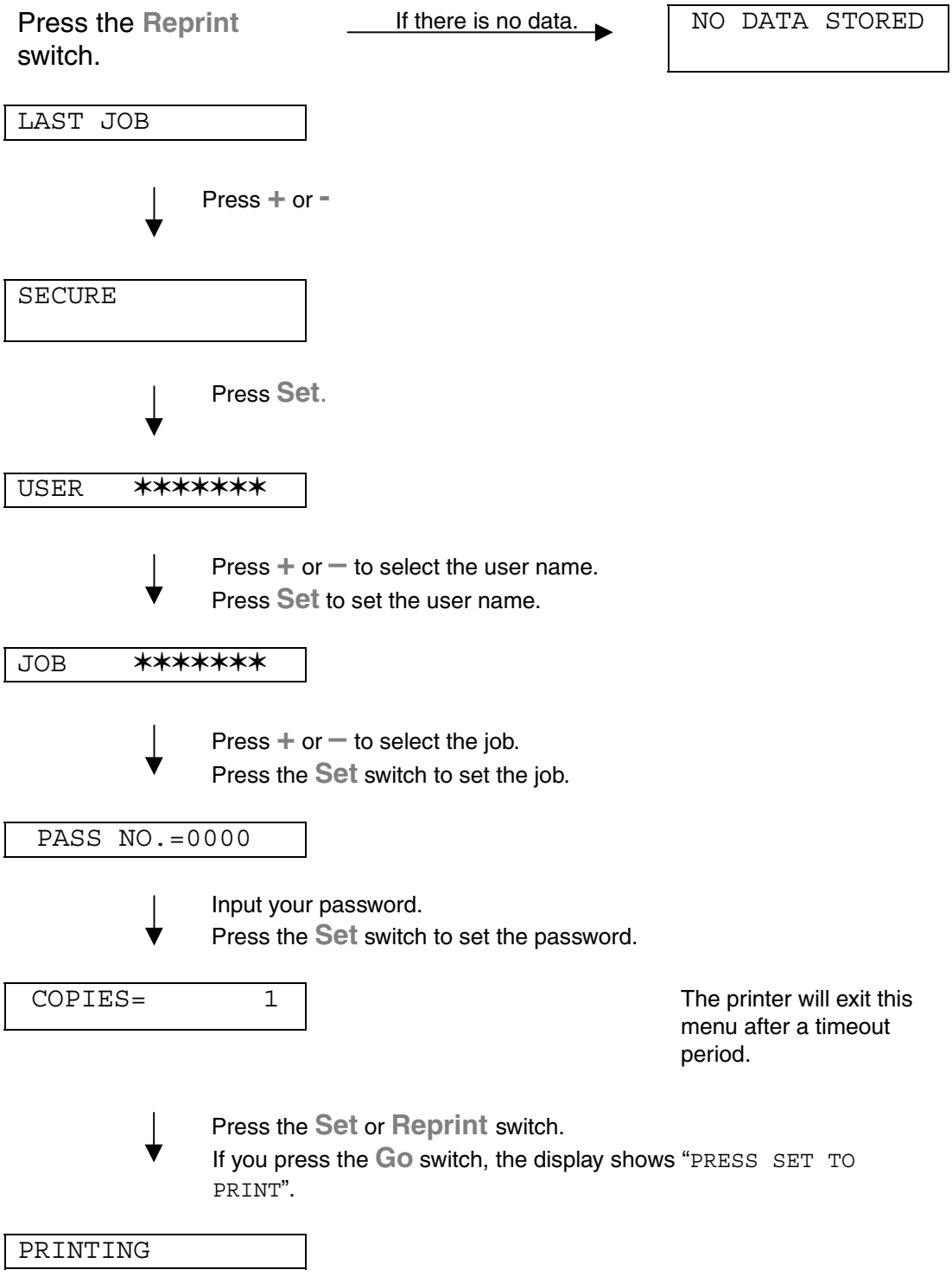
When you want to delete the spooled data, you can carry out this operation on the control panel.

Note

- If there is data in the job information that cannot be displayed on the LCD, the display shows "?".
- You can also reprint the job using the supplied printer driver.

For more information about the settings in the printer driver, see "Job Spooling" in Chapter 2.

Operations for printing secure data



♦ *When there is no reprint data in memory*

If the printer does not have any data in buffer memory and you press the **Reprint** switch, the LCD briefly shows "NO DATA STORED."

♦ *When you cancel the reprint job*

Pressing the **Job Cancel** switch allows you to cancel the reprint job. The **Job Cancel** switch also allows you to cancel a paused reprint job.

+ / – switch

If you press the + or – switch when the printer is the on-line state (READY), it goes off-line and the LCD displays the menu.

❖ To display menus in the current mode

If you press the + or – switch when the printer is in the on-line state (READY), it goes off-line and the LCD displays the current mode.

You can enter other menus in the current mode by pressing the + or – switch. Pressing the + or – switch allows you to scroll forward or backward through the menus and settings on the display. Press or hold the switch until the display shows the desired item.

❖ To set numbers

There are two ways to input numbers. You can press the **+** or **–** switch to scroll up or down to set one number at a time, or you can hold down the **+** or **–** switch to scroll faster. When you see the number you want, press the **Set** switch.

Set switch

If you press the **Set** switch when the printer is in the on-line state (READY), it goes off-line and the LCD displays the current mode.

Pressing the **Set** switch allows you to set the selected menu or the default number. After changing the menu or number, an asterisk appears briefly on the right side of the message and the mode returns to the previous menu.

Back switch

If you press the **Back** switch when the printer is in the on-line state (READY), it goes off-line and the LCD goes to the menu display.

Pressing the **Back** switch allows you to return to the previous level from the current menu level. The **Back** switch also allows you to select the previous digit while inputting numbers. When the leftmost digit is selected, the **Back** switch allows you to go up one level in the menu. When a menu or number without an asterisk (**Set** switch not pressed) is selected, the **Back** switch allows you to return to the previous menu level with the original setting unchanged.

Note

When you press the **Set** switch to select a setting, an asterisk appears briefly at the end of the display. Since the asterisk indicates the selection, you can easily find the current settings as you scroll through the display.

LED

The lamps light or blink to indicate the current printer status.

❖ DATA - Orange LED

LED indication	Meaning
On	Data remains in the printer buffer.
Blinking	Receiving or processing data
Off	No remaining data

LCD display

The display shows the current printer status. When you use the control panel switches, the display will change.

When you take the printer off-line, the display changes to show the selected emulation.

If any problems occur, the display shows the corresponding operator call, error, or service call message to prompt you to take an action. For more information about these messages, see “TROUBLESHOOTING” in Chapter 6.

BACK LIGHTS

Off	The printer is in sleep status.
Green (General)	Warming up
	Ready to print
	Printing
Red (Error)	A problem has occurred with the printer.
Orange (Setting)	Setting Menu
	Setting reprint times
	Pause

❖ Printer Status Messages

The following table shows the printer status messages that are displayed during normal operation:

Printer Status Message	Meaning
READY	Ready to print.
PROCESSING	Busy processing data.
SLEEP	In sleep status (power save mode).
PRINTING	Printing.
SELF TEST	Performing self-diagnostics.
PAUSE	The printer has suspended feeding forms. Pressing the Go switch resumes form feed.
NOW INITIALIZING	The printer is setting up.
WARMING UP	The printer is warming up.
MEMORY SIZE=XX MB	This printer has XX MB memory.
JOB CANCELLING	Cancelling the job.
RESOLUTION ADAPT	Printing with reduced resolution.
PRESS SET TO PRINT	Press the Set switch to start printing.
RESET TO FACTORY SETTING	The printer setting returns to the factory setting.

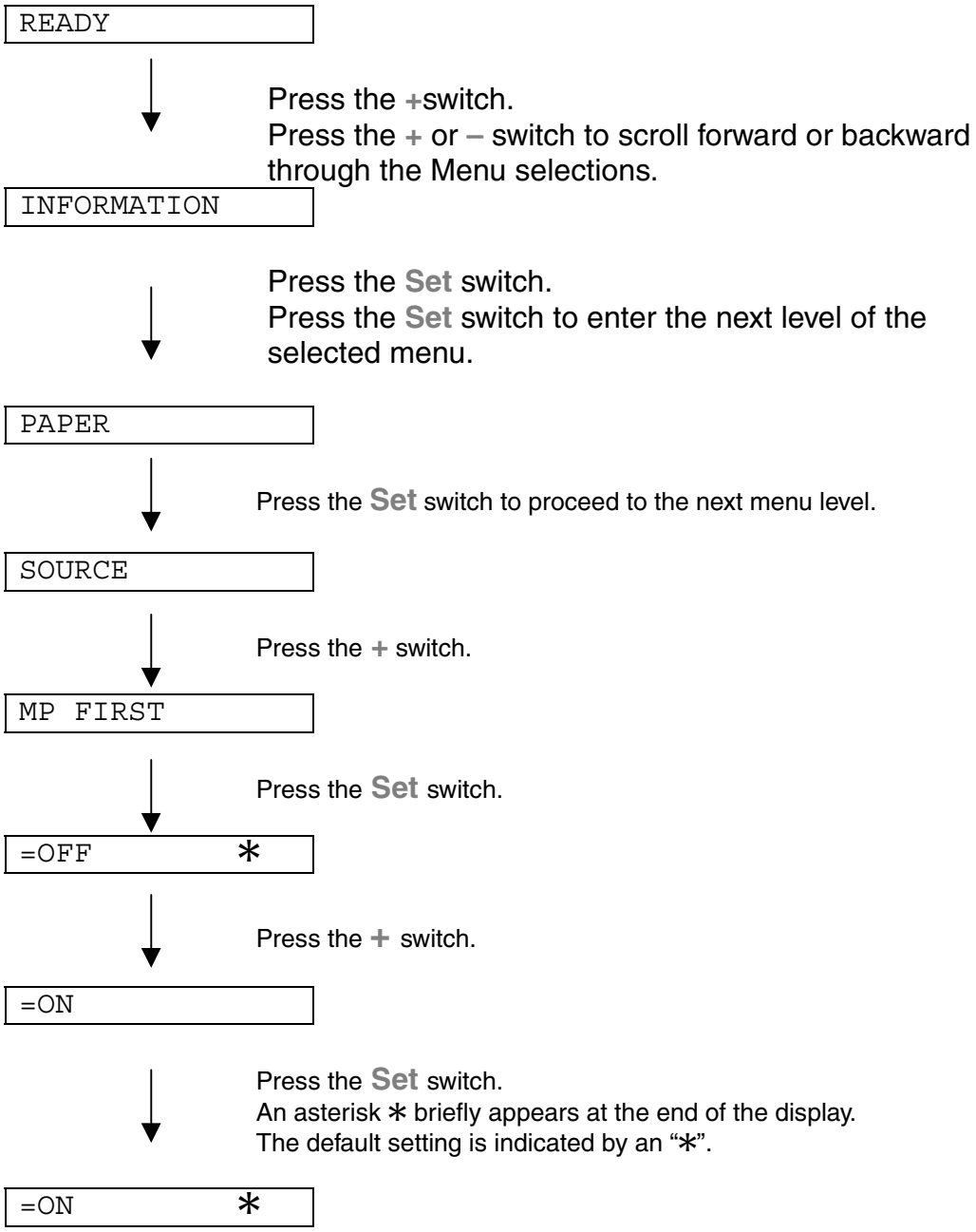
How to use the Control panel

When you operate the **Menu** switches (**+&–, Set, Back**), remember the following basic steps:

- If no control panel operations are performed for 30 seconds, the LCD automatically returns to READY.
- When you press the **Set** switch to select a setting, an asterisk briefly appears at the end of display. After that, the display returns to the previous menu level.
- After changing the status or number, pressing the **Back** switch before pressing the **Set** switch will cause the display to return to the previous menu with the original setting unchanged.
- When you input numbers, you can do it by scrolling through the available range (000 to 999) or by setting digits one at a time. When setting digits one at a time, the blinking digit is the changeable digit.
- When you operate the **+ / –**, **Set**, **Back** switches, remember the following basic steps.

♦ *For example : When you want to turn the MP FIRST setting ON*

Choose this setting to load paper from the Multi-purpose tray first.



Control Panel setting menu

We named the Paper tray in this manual and LCD panel as shown below:

Upper paper tray	Tray 1
Multi-purpose tray	MP tray
Optional lower tray	Tray 2

There are 8 modes. For more information about the selections available for each mode, refer to the pages listed below.

- ***INFORMATION***
  For more information, see 3-21

- ***PAPER***
  For more information, see 3-22

- ***QUALITY***
  For more information, see 3-22

- ***SETUP***
  For more information, see 3-23

- ***PRINT MENU***
  For more information, see 3-24

- ***NETWORK***
  For more information, see 3-30

- ***INTERFACE***
  For more information, see 3-31

- ***RESET MENU***
  For more information, see 3-32

❖ INFORMATION

Setting Menu	Description	
PRINT SETTINGS	Print the Configuration page.	
PRINT TEST	Print the test page.	
RRINT DEMO	Print the demonstration.	
PRINT FILE LIST	Print the file list.	
PRINT FONTS	Print the font list and samples.	
	Sub-Setting Menu	Description
VERSION	SER.NO=#########	Printer serial number.
	ROM VER=####	ROM firmware version (only Network users)
	ROM DATE ##/##/##	ROM date (only Network users)
	NET VER=####	Network firmware version
	NET DATE ##/##/##	Network date
	RAM SIZE=###MB	The size of memory in this printer.
MAINTENANCE	PAGE COUNTER	=######
	REMAIN DRUM	=######
	REMAIN PF KIT1	=######
	REMAIN PF KIT2	=######
	REMAIN FUSER	=######
	REMAIN LASER	=######

❖ PAPER

Setting Menu	Description
SOURCE	=AUTO / MP TRAY /TRAY1 / TRAY2
MP FIRST	=OFF/ON Feed paper from the MP tray first.
MANUAL FEED	=OFF/ON
DUPLEX	=OFF/ON(LONG BIND)/ON(SHORT BIND)

❖ QUALITY

Setting Menu	Description
RESOLUTION	=300/600/HQ1200 You can choose a print resolution of 300, 600 or HQ1200.
HRC	=OFF/LIGHT/MEDIUM/DARK HRC: High Resolution Control offers improved print quality of characters and graphics that conventional laser printers cannot attain with a resolution of 300 or 600 dpi.
TONER SAVE	=OFF/ON
DENSITY	=-6:0:6 Increase or decrease the print density.

❖ SETUP

Setting Menu	Description	
LANUGAGE	= ENGLISH /FRANÇAIS /…	
LCD DENSITY	=0/1/2	
POWER SAVE TIME	=1:99MIN.	
AUTO CONTINUE	=OFF/ON	
LOCK PANEL	=OFF/ON Turn on/off lock panel function.	
	PASS NO.=###	
RERRINT	=ON/OFF	
PAGE PROTECTION	PROTECT = AUTO	AUTO, OFF, LETTER, A4 OR LEGAL
EMULATION	=AUTO (EPSON)/AUTO(IBM)/ HP LASERJET/….	
KEEP PCL	=OFF/ON	
RAMDISK SIZE	=0/1/2…MB	RESTART?
DELETE STORAGE	Delete the internal flash memory print data.	
	Sub-Setting Menu	**Description**
	SECURE FILE	Select the User name, Job name and password.
	DATA ID	=####
	MACRO ID	=####
	FONT ID	=####
	FORMAT	OK?

❖ PRINT MENU

Setting Menu	Description	
MEDIA TYPE	=PLAIN PAPER/TRANSPARENCIES/THIN PAPER/THICK PAPER/THICKER PAPER/BOND PAPER	
PAPER	Set cut sheet paper size to LETTER, LEGAL, A4, A5, A6, B5, B6, EXECUTIVE, COM10, MONARCH, C5 and DL	
COPIES	=1:999 Shows the number of printed pages.	
ORIENTATION	=PORTRAIT/LANDSCAPE This printer can print pages in portrait or landscape orientation.	
PRINT POSITION	This printer can be adjusted to correct the page format.	
	Sub-Setting Menu	Description
	X OFFSET=0	Move the print start position (at the upper left corner of pages) horizontally up to –500 (left) to +500 (right) dots in 300 dpi units.
	Y OFFSET=0	Move the print start position (at the upper left corner of pages) vertically up to –500 (up) to +500 (down) dots in 300 dpi units.
AUTO FF=OFF	=OFF/1:5:99 (sec) Allows you to print the remaining data without pressing the Go switch.	
FF SUPPRESS	=OFF/ON Turn on/off the form feed suppress function.	

❖ PRINT MENU (continued)

Setting Menu	Description	
HP LASERJET	FONT NO.	=I0000:?????
	FONT PITCH/POINT	=???.??
	SYMBOL/CHARACTER SET	PC-8/… Set the symbol set or the character set.
	TABLE PRINT	Print code table.
	AUTO LF=OFF	=OFF/ON ON: CR→CR+LF, OFF: CR→CR
	AUTO CR=OFF	=OFF/ON ON: LF→LF+CR, FF+CR, or VT→VT+CR OFF: LF→LF, FF→FF, or VT→VT
	AUTO WRAP=OFF	=OFF/ON Line feed and carriage return occur when the printer reaches the right margin.
	AUTO SKIP=ON	=ON/OFF line feed and carriage return occur when the printer position reaches the bottom margin.
	LEFT MARGIN	=#### Set the left margin at column 0 to 126 columns at 10 cpi.
	RIGHT MARGIN	=#### Set the right margin at column 10 to 136 columns at 10 cpi.
	TOP MARGIN	=#### Set the top margin at a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0” Factory setting=0.5

Setting Menu	Description	
	BOTTOM MARGIN	=#### Set the bottom margin at a distance from the bottom edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0” Factory setting: 0.33(None-HP), 0.5(HP)
	LINES	=#### Set the number of lines per page from 5 to 128 lines.

❖ PRINT MENU (continued)

Setting Menu	Description	
EPSON FX-850	FONT NO.	=I0000:?????
	FONT PITCH/POINT	=???.??
	SYMBOL/CHARACTER SET	PC-8/… Set the symbol set or the character set.
	TABLE PRINT	Print code table.
	AUTO LF=OFF	=OFF/ON ON: CR→CR+LF OFF: CR→CR
	AUTO MASK	=OFF/ON
	LEFT MARGIN	=#### Set the left margin at column 0 to 126 columns at 10 cpi.
	RIGHT MARGIN	=#### Set the right margin at column 10 to 136 columns at 10 cpi.
	TOP MARGIN	=#### Set the top margin a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0” Factory setting=0.33
	BOTTOM MARGIN	=#### Set the bottom margin a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0” Factory setting=0.33
	LINES	=#### Set the number of lines per page from 5 to 128 lines.

❖ PRINT MENU (continued)

Setting Menu	Description	
IBM PROPRINTER	FONT NO.	=I0000:?????
	FONT PITCH/POINT	=???.??
	SYMBOL/CHARACTER SET	PC-8/… Set the symbol set and the character set.
	TABLE PRINT	Print code table.
	AUTO LF=OFF	=OFF/ON ON: CR→CR+LF, OFF: CR→CR
	AUTO CR=OFF	=OFF/ON
	LEFT MARGIN	=#### Set the left margin at column 0 to 126 columns at 10 cpi.
	RIGHT MARGIN	=#### Set the right margin at column 10 to 136 columns at 10 cpi.
	TOP MARGIN	=#### Set the top margin a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0" Factory setting=0.33
	BOTTOM MARGIN	=#### Set the bottom margin a distance from the top edge of the paper: 0, 0.33, 0.5, 1.0, 1.5 or 2.0" Factory setting=0.33
	LINES	=#### Set the number of lines per page from 5 to 128 lines.

❖ PRINT MENU (continued)

Setting Menu	Description	
BR-SCRIPT	ERROR PRINT	=OFF/ON
	APT	=OFF/ON APT: Advanced Photoscale Technology offers photographic fine grayscale on graphics. APT setting is available only at 600 dpi.

❖ NETWORK

Setting Menu	Description	
TCP/IP	Sub-Setting Menu	Description
	TCP/IP ENABLE	=ON/OFF
	IP ADDRESS=	###.###.###.###
	SUBNET MASK=	###.###.###.###
	GATEWAY=	###.###.###.###
	IP BOOT TRIES	=#
	IP METHOD	=AUTO/STATIC/RARP/BOOTP/DHCP
NETWARE	NETWARE ENABLE	=ON/OFF
	NET FRAME	=AUTO/8023/ENET/8022/SNAP
APPLETALK	=ON/OFF	
NETBEUI	=ON/OFF	
DLC/LLC	=ON/OFF	
BANYAN	=ON/OFF	
LAT	=ON/OFF	
NETBIOS/IP	=ON/OFF	
ENET	=AUTO/100B-FD/100B-HD/10B-FD/10B-HD	

❖ INTERFACE

<table>
<tr><th>Setting Menu</th><th colspan="2">Description</th></tr>
<tr><td>AUTO IF TIME</td><td colspan="2">= 1:5:99 (sec)

You must set the timeout period for the auto interface selection.</td></tr>
<tr><td>INPUT BUFFER</td><td>= Level1:5:15

Increase or decrease the input buffer capacity.</td><td>RESTART PRINTER?</td></tr>
<tr><td rowspan="3">PARALLEL</td><td colspan="2">When using the parallel interface</td></tr>
<tr><td>Sub-setting Menu</td><td>Description</td></tr>
<tr><td>HIGH SPEED</td><td>=ON/OFF

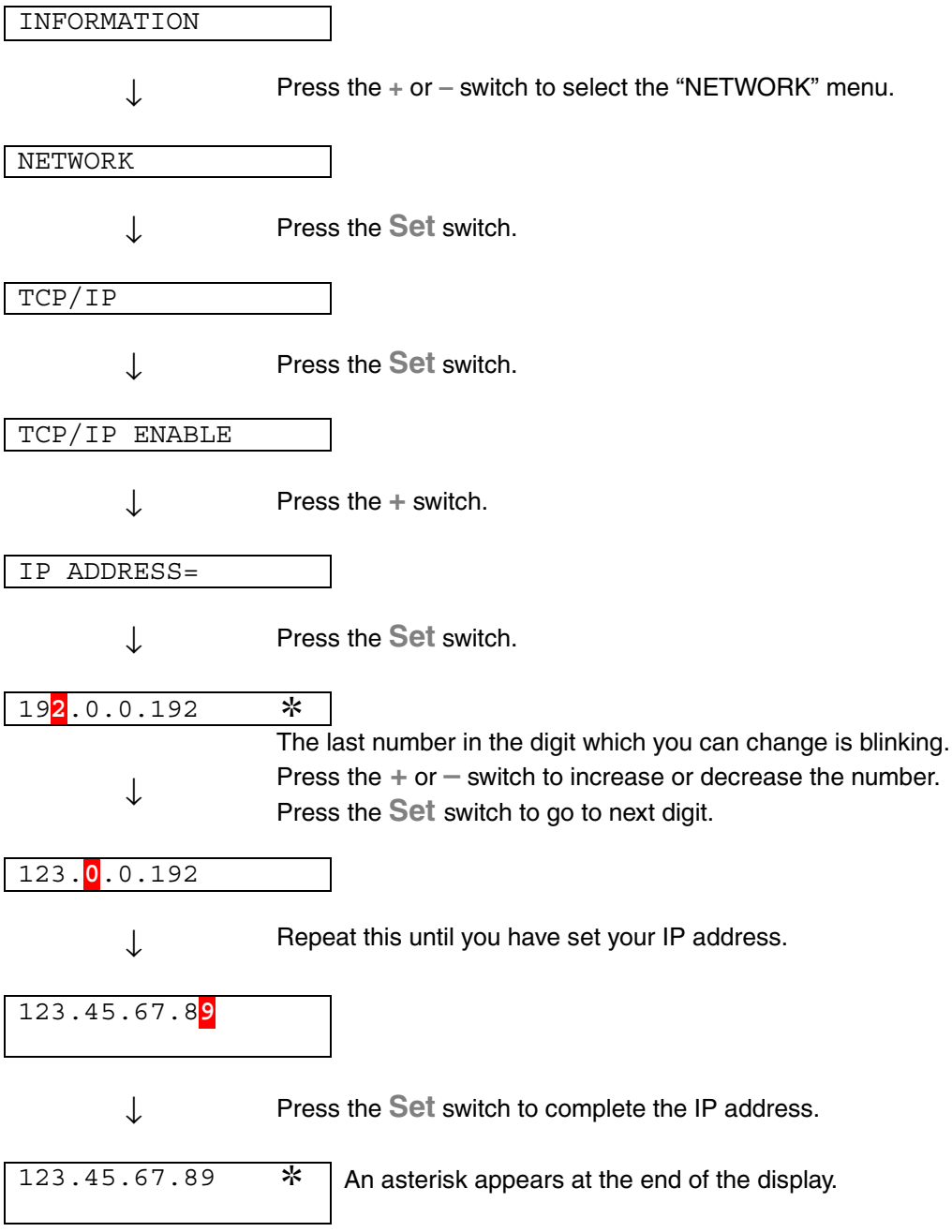
Turns the high speed parallel communications ON/OFF.</td></tr>
<tr><td>BI-DIR=ON/OFF</td><td>=ON/OFF

Turns the bi-directional parallel communications ON/OFF.</td></tr>
</table>

❖ RESET MENU

Setting Menu	Description
RESET PRINTER	Resets the printer and restores all printer settings – including command settings – to settings you have previously made with the control panel switches.
FACTORY RESET	Resets the printer and restores all printer settings – including command settings – to the factory settings. See "List of Factory Settings".

❖ Set IP Address



❖ About Emulation Modes

This printer has the following emulation modes.

♦ HP LaserJet Mode

The HP LaserJet mode (or HP mode) is the emulation mode in which this printer emulates the Hewlett-Packard LaserJet laser printer. Many software applications support this type of laser printer. Using this mode will allow your printer to operate at its optimum performance with those applications.

♦ BR-Script 3 Mode

BR-Script is an original page description language and a PostScript language emulation interpreter. This printer supports level 3. The BR-Script interpreter of this printer enables full and satisfactory control of text and graphics on pages.

Average users will not need extensive knowledge of the PostScript language. However, if you want to obtain technical information about PostScript commands, see the following commercial manuals:

- Adobe Systems Incorporated. PostScript Language Reference Manual, 2nd Edition. Menlo Park: Addison-Wesley Publishing Company, Inc., 1990.
- Adobe Systems Incorporated. PostScript Language Program Design. Menlo Park: Addison-Wesley Publishing Company, Inc., 1988.
- Adobe Systems Incorporated. PostScript Language Reference Manual. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. PostScript Language Tutorial and Cookbook. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. PostScript Language Reference Manual, third Edition. Addison-Wesley Longman, Inc., 1999.

♦ *EPSON FX-850 and IBM Proprinter XL Mode*

The EPSON FX-850 and IBM Proprinter XL modes are the emulation modes that this printer emulates to meet the industry-standard for dot matrix printers of their respective manufacturers. Some applications support these dot matrix printer emulations. Use these emulation modes for optimum performance when printing from those types of applications.

❖ List of Factory settings

The following table shows the initial factory default settings.

Note

- The settings are subject to the emulation mode. Effective modes are indicated in parentheses in the following table.
- The following settings cannot be restored to the factory settings with the RESET menu in the "FACTORY SETTINGS" mode: INTERFACE MODE, HRC SETTING, PAGE PROTECTION, SCALABLE FONT, LOCK PANEL, PAGE COUNTER and local language for display messages.
- The COPY setting is always restored to the factory setting when the printer is turned off and on again.
- It is not possible to reset NETWORK setting on the Control panel. If you wish to reset the print server back to its default factory settings (resetting all information such as the password and IP address information) hold down the Network Test Button of the Network board (NC-4100h) for more than 5 seconds.

MODE	MENU	Factory Setting
PAPER	SOURCE	=AUTO
	MP FIRST	=OFF
	MP SIZE=	=A4/LTR
	MANUAL FEED	=OFF
	DUPLEX	=OFF
QUALITY	RESOLUTION	=600
	HRC	=MEDIUM
	TONER SAVE	=OFF
	DENSITY	=0
SETUP	LANGUAGE	=ENGLISH
	LCD DENSITY	=0
	POWER SAVE TIME	=5 MIN.
	AUTO CONTINUE	=OFF
	LOCK PANEL	=OFF
	REPRINT	=ON
	EMULATION	=AUTO (EPSON)
	KEEP PCL	=OFF

MODE	MENU	Factory Setting
PRINT MENU	MEDIA TYPE	=PLAIN PAPER
	PAPER	=A4/LETTER
	COPIES	=1
	ORIENTATION	=PORTRAIT
	PRINT POSITION	X OFFSET=0 Y OFFSET=0
	AUTO FF TIME	=5
	FF SUPPRESS	=OFF
	HP LASER JET	FONT NO.=59
		FONT PITCH/POINT=10.00/12.00
		SYMBOL/CHARACTER SET=PC8
		AUTO LF=OFF
		AUTO CR=OFF
		AUTO WRAP=OFF
		AUTO SKI=ON
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####

MODE	MENU	Factory Setting
	EPSON FX-850	FONT NO.=59
		FONT PITCH/POINT=10.00/12.00
		SYMBOL/CHARACTER SET=US ASCII
		AUTO LF=OFF
		AUTO MASK=OFF
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####
	IBM PROPRINTER	FONT NO.=59
		FONT PITCH/POINT=10.00/12.00
		SYMBOL/CHARACTER SET=PC8
		AUTO LF=OFF
		AUTO CR=OFF
		LEFT MARGIN=####
		RIGHT MARGIN=####
		TOP MARGIN=####
		BOTTOM MARGIN=####
		LINES=####

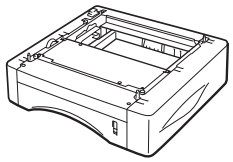
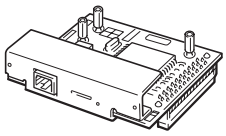
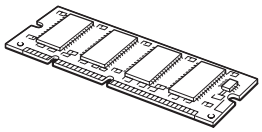
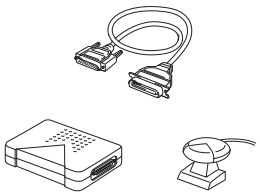
MODE	MENU	Factory Setting
	BR-SCRIPT	ERROR PRINT=OFF
		APT=OFF
NETWORK	TCP/IP	TCP/IP ENABLE=ON
		IP METHOD=AUTO
		IP ADDRESS=192.0.0.192
		SUBNET MASK=0.0.0.0
		GATEWAY=0.0.0.0
		IP BOOT TRIES=3
		IP METHOD=AUTO
	NETWARE	NETWARE ENABLE=ON
		NEE FRAME=AUTO
	APPLETALK	=ON
	NETBEUI	=ON
	DLC/LLC	=ON
	BANYAN	=ON
	LAT	=ON
	NETBIOS/IP	=ON
	ENET	=AUTO

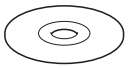
CHAPTER 4
OPTIONS

Optional accessories

This printer has the following optional accessories. You can increase the capabilities of the printer with these items.

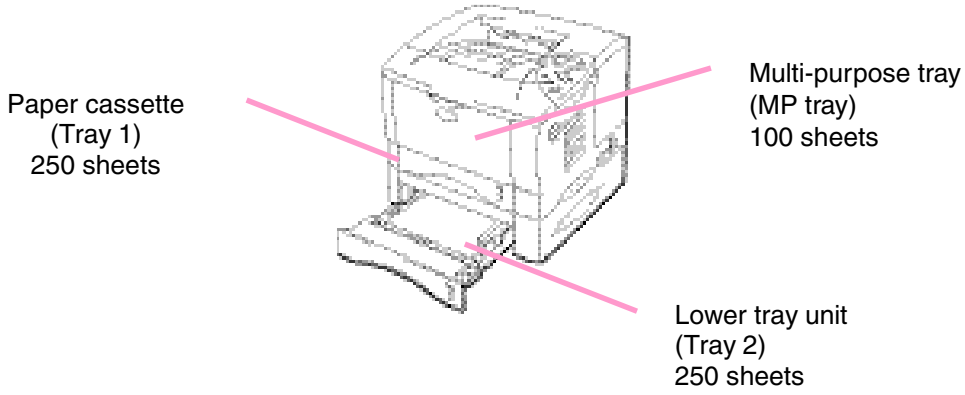
♦ Options

Lower tray unit	*Network board*	*Additional memory*	*IrDA interface*
LT-500	NC-4100h	100pin DIMM	IR-1000
			
See Lower tray unit in this chapter	See Network option in this chapter	See RAM expansion in this chapter	See IrDA interface in this chapter

Optional font package
BS-3000

See Optional font package in this chapter

Lower tray unit (LT-500)

The Lower tray unit (tray 2) is a device that functions as an additional paper source. It can hold a maximum of 250 sheets of paper (80 g/m^2 or 21 lb.).



Expands up to 600 sheets total

Fig. 4-1

To purchase the *optional* Lower tray unit (tray 2), consult the dealer where you purchased the printer.

Installing the Lower tray unit

Install the *optional* Lower tray unit under the printer as follows:

☛ **1.** Turn off the power switch, and then unplug the power cord.

☛ **2.** Close the Process cover, Multi-purpose tray, Face up output tray and Extension flap.

☛ **3.** Lift the printer carefully with both hands and place it on top of the Lower tray unit, so that the alignment pins of the Lower tray unit are inserted into the guide holes in the underside of the printer.

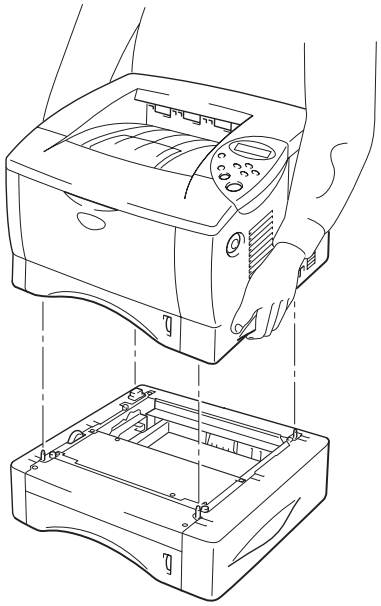
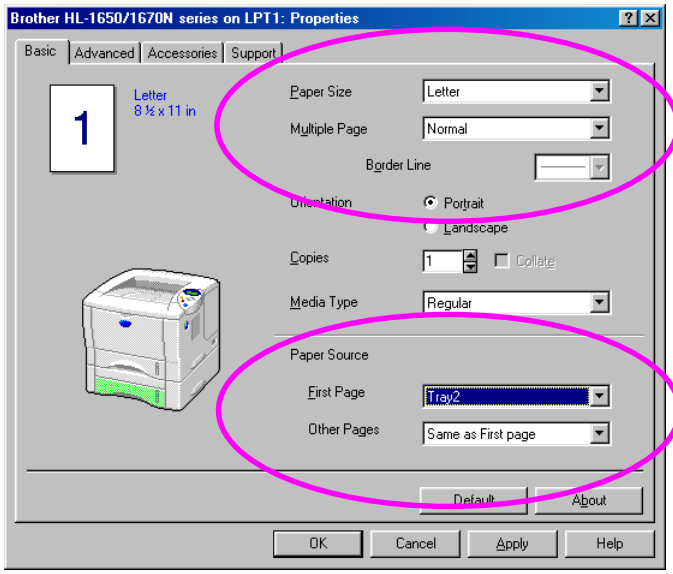


Fig. 4-2

Follow the instructions supplied with the Lower tray unit.

Change the following settings in the printer driver Properties tab.



Select the paper size.

Select the Paper Source and Media type.

Network option (NC-4100h)

Installing the Network board enables you to use the printer in the TCP/IP, IPX/SPX, AppleTalk, DLC/LLC, Banyan VINES, DEC LAT and NetBEUI environments. Also, useful utilities such as BR-Admin 32 and Network Printing software for the administrator are included.
For more information about Set Up, see the Network User's Guide.

Installing the Network board

☛ **1.** Turn off the printer, and then unplug the power cord. Disconnect the interface cable (printer cable) from the printer.

☛ **2.** Open the Interface cover.

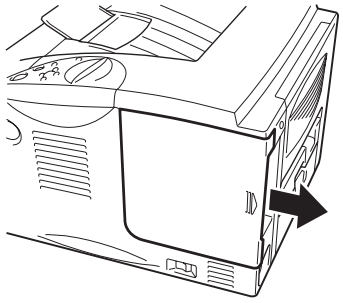


Fig. 4-3

☛ **3.** Unscrew the two screws that secure the PCB access plate. Remove the plate.

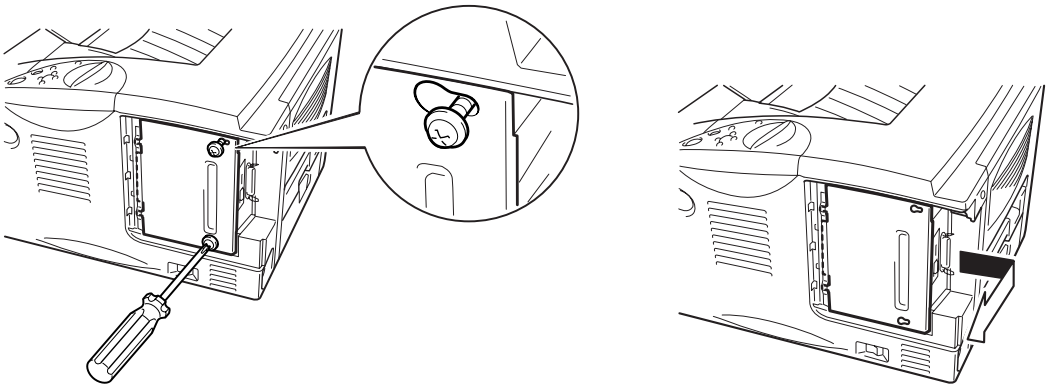


Fig. 4-4

☛ **4.** Remove the two screws securing the Network board cover plate and remove the plate.

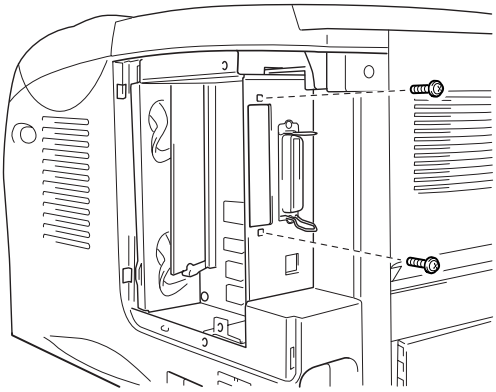


Fig. 4-5

☛ **5.** Unpack the Network board.

☛ **6.** Insert the Network board connector into the PCB connector, and then secure it with the two screws removed in Step 4.

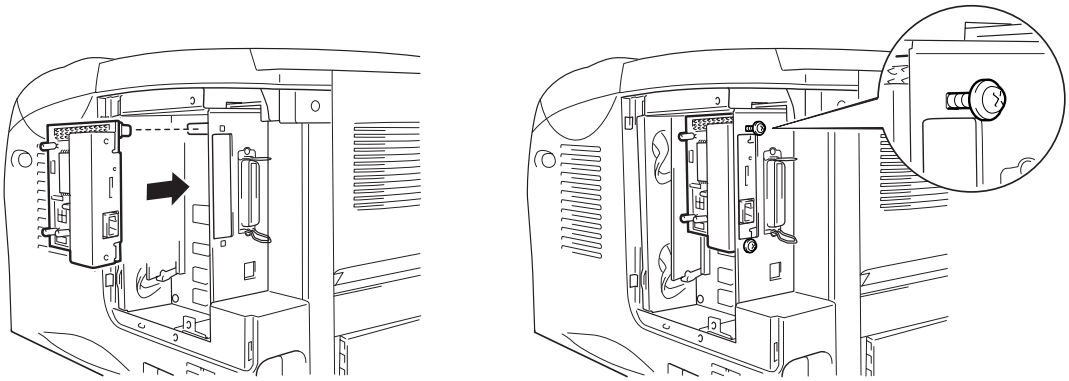


Fig. 4-6

☛ **7.** Re-install the PCB access plate, and then secure it with the two screws you removed in Step 3.

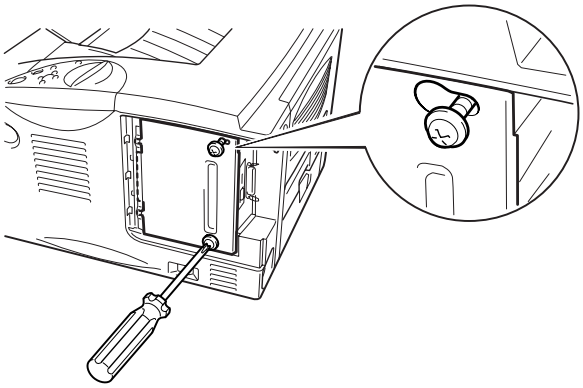


Fig. 4-7

☛ **8.** Close the Interface cover.

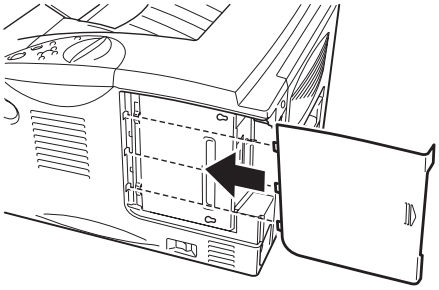


Fig. 4-8

☛ **9.** Plug the power cord into the AC outlet, and then turn on the power switch.

RAM expansion

HL-1650:
This printer has 8 Mbytes of standard memory and one slot for optional expansion memory. The memory can be expanded up to 136 Mbytes by installing commercially available dual in-line memory modules (DIMMs). (The standard memory installed varies depending on the country where it is purchased.)

HL-1670N:
This printer has 16 Mbytes of standard memory and one slot for optional expansion memory. The memory can be expanded up to 144 Mbytes by installing commercially available dual in-line memory modules (DIMMs). (The standard memory installed varies depending on the country where it is purchased.)

This printer uses memory modules that are: 100 pins, no-parity, SDRAM with 64Mbit or more. This printer is not compatible with Extended Data Output (EDO) DIMM, or DIMM that uses 16 Mbit SDRAM.

♦ *Minimum memory recommendation*

HL-1650 (Including 8 Mbytes of internal memory)

HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes

	300 dpi	600 dpi	HQ1200
Letter/A4	Standard	Standard	24 Mbytes
Legal	Standard	Standard	24 Mbytes

BR-Script 3 mode

	300 dpi	600 dpi	HQ1200
Letter/A4	Standard	Standard	24 Mbytes
Legal	Standard	Standard	24 Mbytes

Duplex printing

	300 dpi	600 dpi	HQ1200
HP LaserJet	Standard	24 Mbytes	40 Mbytes
BR-Script 3	Standard	24 Mbytes	40 Mbytes

HL-1670N (Including 16 Mbytes of internal memory)

HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes

	300 dpi	600 dpi	HQ1200
Letter/A4	Standard	Standard	Standard
Legal	Standard	Standard	Standard

BR-Script 3 mode

	300 dpi	600 dpi	HQ1200
Letter/A4	Standard	Standard	Standard
Legal	Standard	Standard	Standard

Duplex printing

	300 dpi	600 dpi	HQ1200
HP LaserJet	Standard	Standard	32 Mbytes
BR-Script 3	Standard	Standard	32 Mbytes

The following DIMM size can be installed:

• 16 Mbyte	TECHWORKS	PM-HP 16M-BR
• 32 Mbyte	TECHWORKS	PM-HP 32M-BR
• 64 Mbyte	TECHWORKS	PM-HP 64M-BR
• 128 Mbyte	TECHWORKS	PM-HP 128M-BR

In general, DIMM must have the following specifications:

Type:	100 pin and 32 bit output
CAS Lantency	2 or 3
Clock Frequency	66MHz or more
Capacity:	16, 32, 64 Mbyte or 128 Mbyte
Height:	46mm (1.8 inches) or less
Parity	NONE
Dram Type:	SDRAM 4 Bank

SDRAM can be used.

Note

- For more information, consult the dealer where you purchased the printer.
- For the latest information, please visit our user support web site.

Installing additional memory

Install additional memory (DIMM) as follows:

☛ **1.** Turn off the printer, and then unplug the power cord from the AC outlet. Disconnect the interface cable (printer cable) from the printer.

Note

Be sure to turn off the power to the printer *before* you install or remove the DIMM.

☛ **2.** Open the Interface cover.

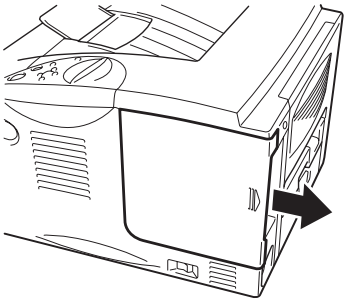


Fig. 4-9

☛ **3.** Unscrew the two screws that secure the PCB access plate. Slide the plate toward you and remove it.

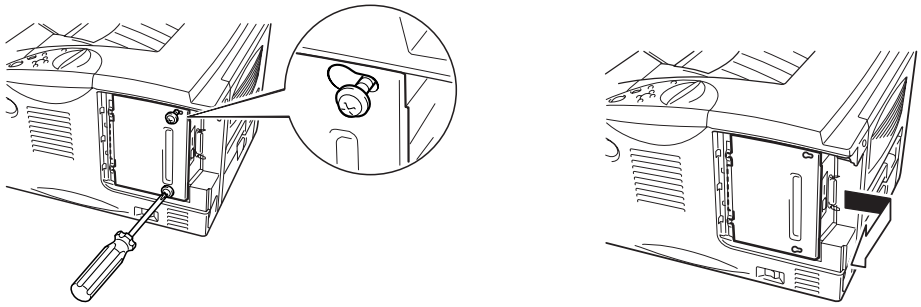


Fig. 4-10

☛ **4.** Unpack the DIMM and hold it by the edges.

Caution

DIMM boards can be damaged by even a small amount of static electricity. Do not touch the memory chips or the board surface. Wear an antistatic wrist strap when you install or remove the board. If you do not have an antistatic wrist strap, frequently touch the bare metal on the printer.

☛ **5.** Holding the DIMM by the edges, align the notches on the DIMM with the DIMM slot.

☛ **6.** Press the DIMM straight into the slot (press firmly). Make sure the locks on each side of the DIMM snap inward into place. (To remove a DIMM, the locks must be released.)

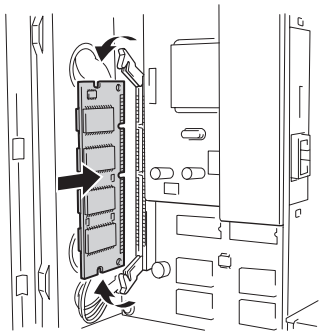


Fig. 4-11

☛ **7.** Install the PCB access plate. Secure the PCB access plate with the two screws.

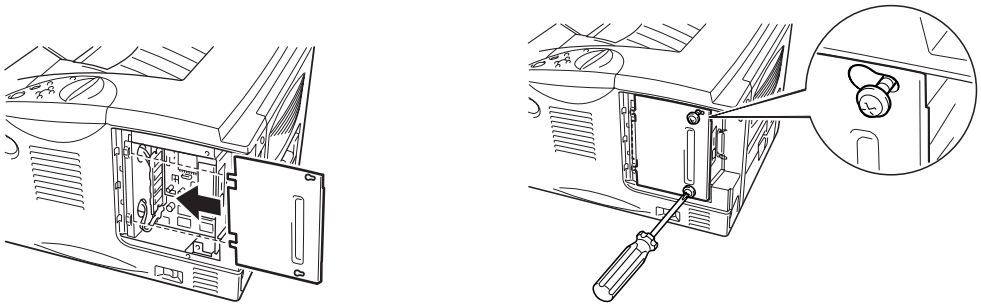


Fig. 4-12

☛ **8.** Close the Interface cover.

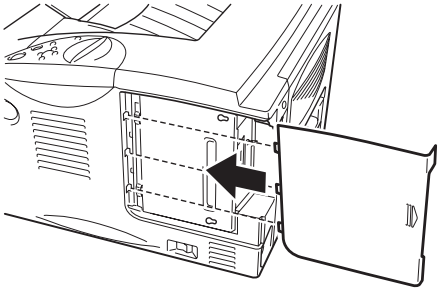


Fig. 4-13

☛ **9.** Reconnect the interface cable (printer cable) from your computer. Plug the power cord into the AC outlet, and then turn on the power switch.

☛ **10.** After you turn on the printer, the current RAM disk size will appear on the LCD. Check it to make sure you added the new memory correctly.

IrDA interface (IR-1000)

IR-1000 connects to any printer and print data without connecting cables.

- Support IrDA1.1 Infrared communication standard.
- Fully compatible with Windows® 95/98/Windows® Me, Windows NT® 4.0,Windows® 2000 Infrared printer device.
- Transmits and receivers data up to 4 Mbits/s.
- Connects to PC parallel port and connects to Centronic port on printer.
- Allows a printer to communicate with an infrared-equipped portable computer.
- Transmission range : 1 cm (0.39 inch) up to 100 cm (39 inch) meet IrDA standard.
- 30 degrees cone angle.
- Selects between infrared or parallel port.

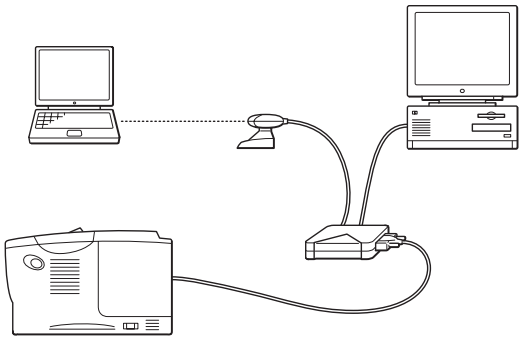


Fig. 4-14

Optional font package (BS-3000)

The optional font package (BS-3000) is a CD-ROM from which you can install the 136 PS3 Agfa TrueType Fonts.

CHAPTER 5
ROUTINE MAINTENANCE

Replacing the consumables

You need to replace the consumables periodically. When the time comes to replace consumables, the following messages will appear on the LCD panel.

(appears at intervals)

```
TONER LOW
```

See the TONER LOW message explanation in this chapter.

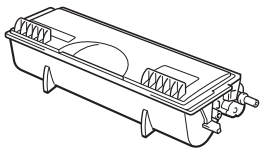
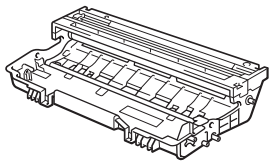
```
TONER EMPTY
```

See the TONER EMPTY message explanation in this chapter.

```
CHANGE DRUM SOON
```

See the CHANGE DRUM SOON message explanation in this chapter.

- ***Accessories***

Toner cartridge	Drum unit
	
See Replacing the Toner cartridge in this chapter	See Replacing the Drum unit in this chapter

❖ *Periodic maintenance parts*

You need to replace the maintenance parts periodically to maintain print quality. When it is time to replace parts, the following messages will appear on the LCD.

REPLACE FUSER

See “Maintenance messages” in this chapter.

REPLACE PF KIT

See “Maintenance messages” in this chapter.

REPLACE LASER

See “Maintenance messages” in this chapter.

❖ Toner cartridge

A new toner cartridge contains enough toner to print approximately 6,500 A4/Letter-size single-sided pages at about 5% coverage (if the print density is set at level 0).

Note

- Toner consumption varies according to the image coverage on the page and the print density setting.
- The greater the image coverage, the greater the toner consumption.
- If you change the print density setting for lighter or darker printing, toner consumption varies accordingly.
- Wait to unpack the toner cartridge until immediately before you install it in the printer.

❖ *TONER LOW message*

(appears at intervals)

TONER LOW

If the LCD shows this message, the toner cartridge has nearly run out of toner. Purchase a new toner cartridge and have it ready before you get a TONER EMPTY message. To replace the toner cartridge, refer to ”Replacing the Toner Cartridge” in this chapter.

❖ TONER EMPTY message

Check printed pages, page counter, and display messages routinely. If the display shows the following message, the printer has run out of toner or the toner is not evenly distributed inside the cartridge.

```
TONER EMPTY
```

❖ Replacing the Toner cartridge

Note

To ensure optimum print quality, be sure to use quality toner cartridges. To obtain toner cartridges, consult the dealer where you purchased the printer.

☛ **1** Press the Cover release button and then open the Front cover.

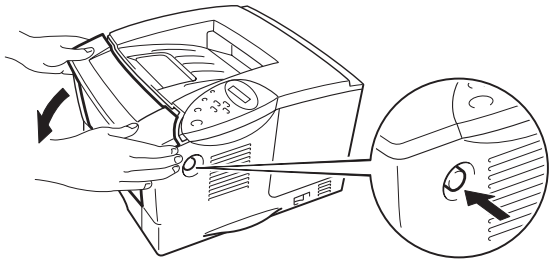


Fig. 5-1

☛ **2.** Pull out the Drum unit assembly.

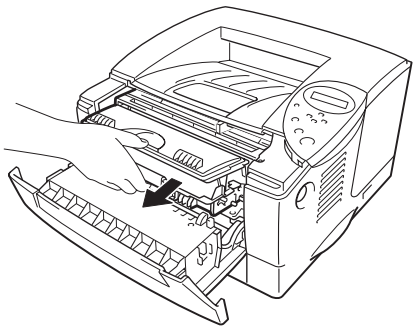
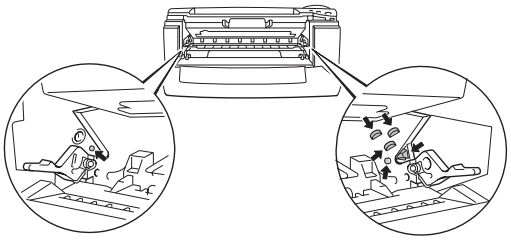


Fig. 5-2

Caution

- We recommend that you place the Drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner.
- To prevent damage to the printer from static electricity, do not touch the electrodes shown below.



☛ **3.** Press the Lock lever down, and then pull the Toner cartridge out of the Drum unit assembly.

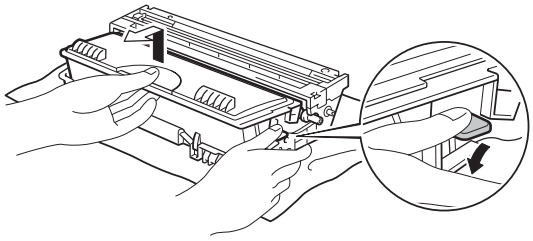


Fig. 5-3

Caution

- Handle the toner cartridge carefully. If toner scatters on your hands or clothes, immediately wipe or wash it off with cold water.

Note

- Be sure to seal the toner cartridge tightly so that toner powder does not spill out of the cartridge.
- Dispose of the used toner cartridge in accordance with local plastic waste regulations.

☛ **4.** Unpack the new Toner cartridge. Keeping the cartridge horizontal, gently rock it from side to side five or six times.

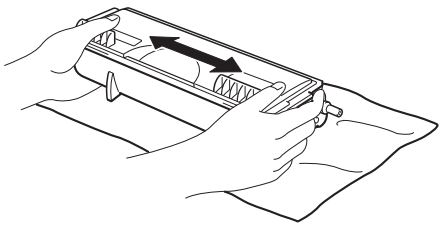


Fig. 5-4

Caution

- Wait to unpack the Toner cartridge until immediately before you install it in the printer. If Toner cartridges are left unpacked for a long period of time the toner life will be shortened.
- If an unpacked Drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.
- Use a genuine Brother Toner cartridge that is specially formulated to ensure optimum print quality.
- Printing with a 3rd party toner or 3rd party Toner cartridge may reduce not only the print quality but also the quality and life of the printer itself. It may also cause serious damage to the performance and life of a Drum unit. Warranty coverage does not apply to problems caused by the use of 3rd party toner, 3rd party Toner cartridges or 3rd party Drum units.

☛ **5** Remove the protective cover.

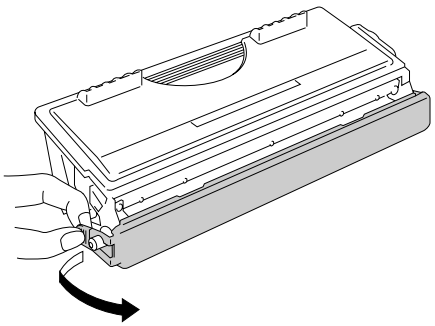
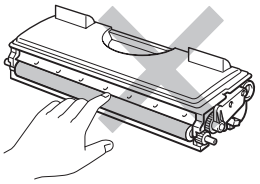
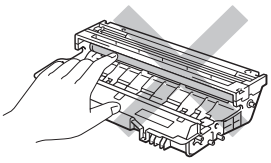


Fig. 5-5

Caution

Install the Toner cartridge immediately after you remove the protective cover. Do not touch the shaded parts shown below.





☛ **6.** Install the new Toner cartridge into the Drum unit until you hear it lock into place. When the Toner cartridge is installed correctly, the Lock lever is lifted automatically.

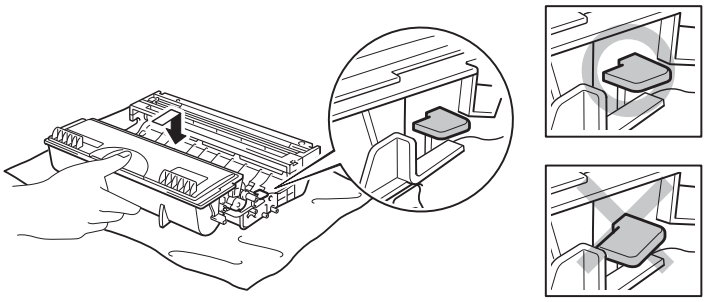


Fig. 5-6

Caution

Make sure you install the Toner cartridge correctly or it may separate from the Drum unit when you pick up the Drum unit assembly.

☛ **7.** Clean the primary corona wire inside the Drum unit by gently sliding the blue tab from right to left several times. Return the tab to the Home position (▲) before you re-install the Drum unit assembly.

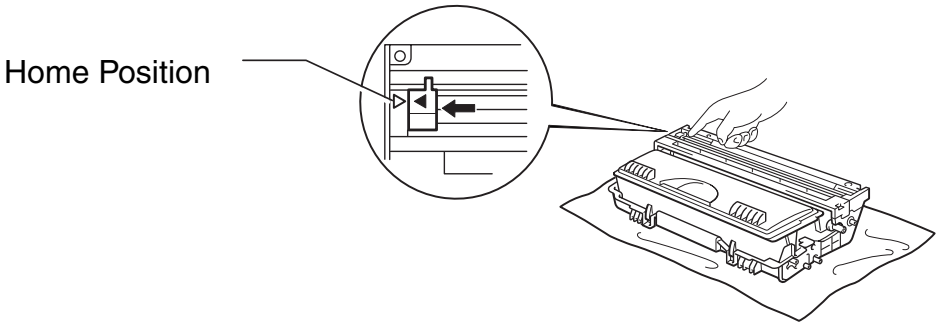


Fig. 5-7

Caution

Make sure that you return the tab to the home position (▲) before you re-install the Drum unit assembly in the printer; otherwise, printed pages may have vertical stripes.

☛ **8.** Re-install the Drum unit assembly into the printer. Close the Front cover.

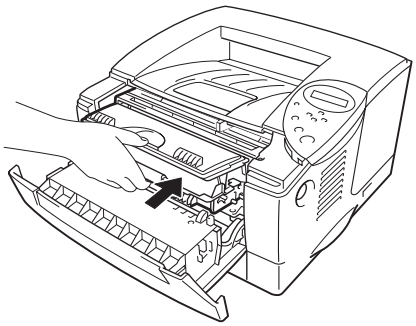


Fig. 5-8

Note

We recommend that you clean the printer when you replace the Toner cartridge. See “Cleaning” in this chapter.

❖ CHANGE DRUM SOON message

CHANGE DRUM SOON

The printer uses a Drum unit to create the print images on paper. If the display shows the above message, it means the Drum unit is near the end of its life. We recommend that you replace the Drum unit with a new one before there is a noticeable deterioration in the print quality.

❖ Replacing the Drum unit

This printer can print approximately 20,000 pages [*1] with one Drum unit.

[*1] At 5% coverage print (A4-Letter size). The actual number of printed pages may vary depending on the average type of print job and paper.

Note

There are many factors that determine the actual drum life, such as temperature, humidity, type of paper, type of toner used, the number of pages per print job, etc. Under ideal conditions, the average drum life is estimated at approximately 20,000 pages. The actual number of pages that your drum will print may be significantly less than this estimate. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.
For best performance, use only genuine Brother toner. The printer should be used only in a clean, dust-free environment with adequate ventilation.

☛ **1.** Press the Cover release button; and then open the Front cover.

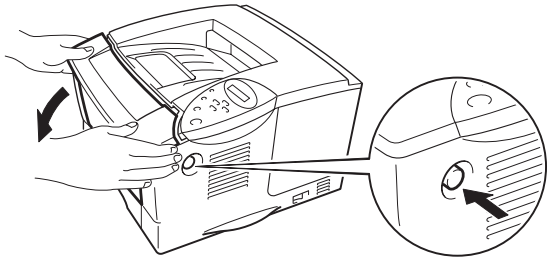


Fig. 5-9

☛ **2.** Pull out the Drum unit assembly.

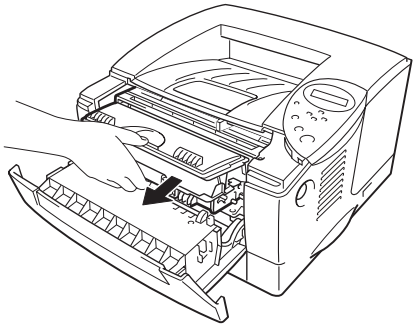
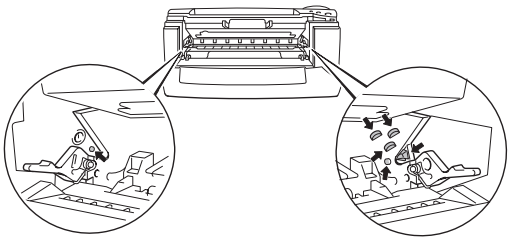


Fig. 5-10

Caution

- We recommend that you place the Drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner.
- To prevent damage to the printer from static electricity, do not touch the electrodes shown below.



☛ **3.** While pressing the Lock lever, pull the Toner cartridge out of the Drum unit assembly.

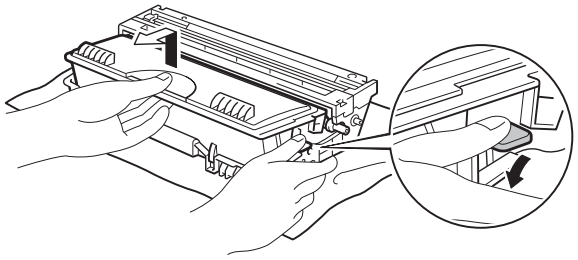


Fig. 5-11

Caution

Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.

Note

Discard the used Drum unit according to local regulations. Be sure to seal up the Drum unit tightly so that toner powder does not spill out of the unit. Handle the Toner cartridge carefully. If toner scatters on your hands or clothes, immediately wipe or wash it off with cold water.

☛ **4.** Unpack the new Drum unit.

Caution

Wait to unpack a Drum unit until immediately before you install it in the printer. If an unpacked Drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.

☛ **5.** Install the Toner cartridge into the new Drum unit until you hear it lock into place with a click. When the Toner cartridge is installed correctly, the lock lever is lifted automatically.

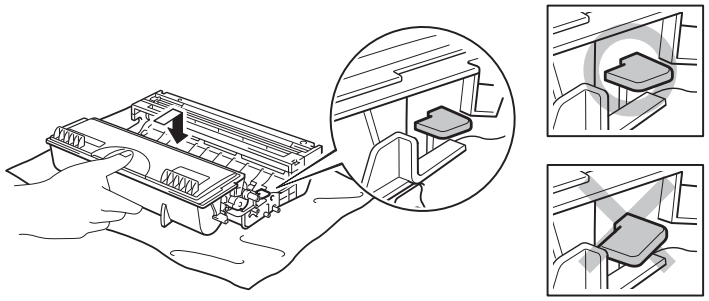


Fig. 5-12

Caution

Make sure you install the Toner cartridge correctly, or it may separate from the Drum unit when you pick up the Drum unit assembly.

☛ **6.** Re-install the Drum unit assembly in the printer.

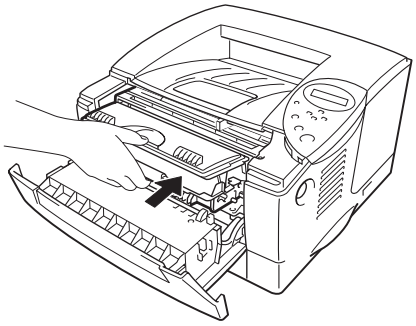


Fig. 5-13

☛ **7.** Reset the page counter referring to the instructions supplied with the new Drum unit.

Note

Do not reset the page counter when you replace only the Toner cartridge.

☛ **8.** Close the Front cover.

Note

We recommend that you clean the printer when you replace the Drum unit. See “How to clean the printer” in this chapter.

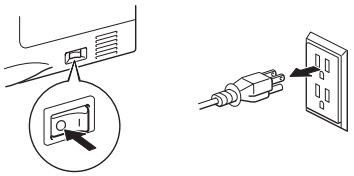
Cleaning

Clean the printer exterior and interior routinely. If printouts are stained with toner, clean the printer interior and Drum unit.

❖ Cleaning the printer exterior

Warning

There are high voltage electrodes inside the printer. Before cleaning the printer, make sure you have turned off the power switch and unplugged the power cord from the power outlet.



☛ **1.** Turn off the printer, and then unplug the power cord.

☛ **2.** Wipe dirt and dust away from the printer exterior with a damp cloth and allow the printer to dry completely before turning the power on again.

Note

Use water or neutral detergents for cleaning. Cleaning with volatile liquids such as thinner or benzene will damage the surface of the printer.
Do not use cleaning materials that contain ammonia. They will damage the printer and the Toner cartridge.

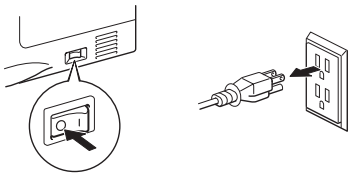
☛ **3.** Plug in the power cord.

❖ *Cleaning the printer interior*

☛ **1.** Turn off the power switch, and then unplug the power cord.

⚠ ***Warning***

There are high voltage electrodes inside the printer. Before cleaning the printer, make sure you have turned off the power switch and unplugged the power cord from the outlet.



☛ **2.** Press the Cover release button, and then open the Front cover.

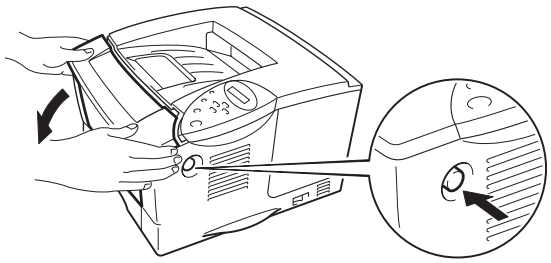


Fig. 5-14

☛ **3.** Pull the Drum unit assembly out of the printer.

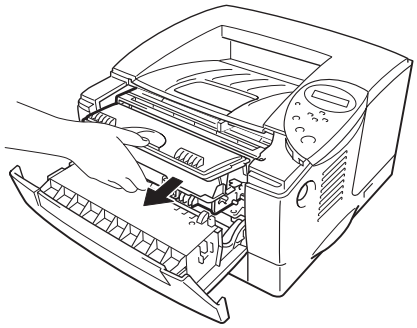


Fig. 5-15

Caution

Handle the Drum unit carefully since it contains toner. If toner scatters and your hands or cloths get dirty, immediately wipe or wash it off with cold water.

Note

We recommend that you place the Drum unit on a piece of disposable paper or cloth in case you accidentally spill or scatter toner.

☛ **4.** Gently wipe the scanner window with a soft dry cloth.

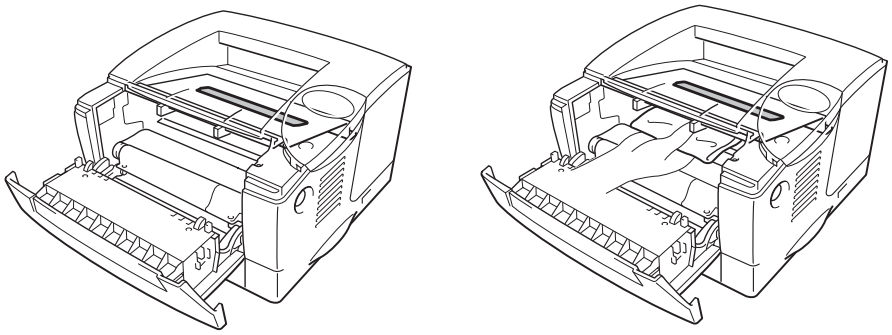
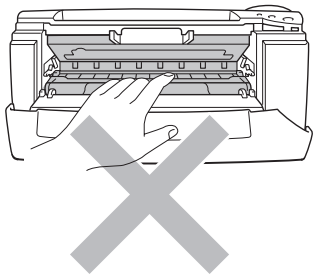


Fig. 5-16

Warning

After you have just used the printer, some internal parts of the printer are extremely **HOT!** When you open the covers of the printer, never touch the shaded parts shown in the following illustrations.



Caution

- Do not touch the scanner window with your fingers.
- Do not wipe the scanner window with isopropyl alcohol.

☛ **5.** Re-install the Drum unit assembly into the printer. Close the Front cover.

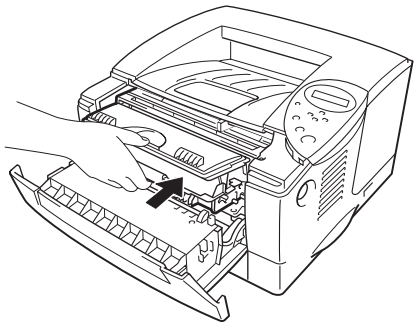


Fig. 5-17

☛ **6.** Plug in the power cord, and then turn on the power switch.

❖ *Cleaning the corona wire*

☛ **1** Press the Cover release button, and then open the Front cover.

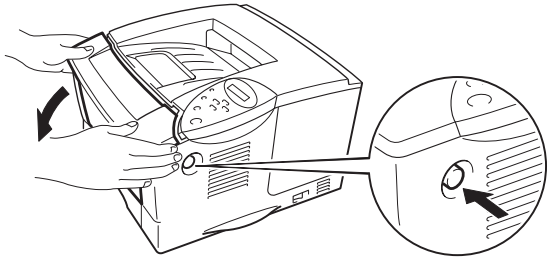


Fig. 5-18

☛ **2.** Pull out the Drum unit assembly.

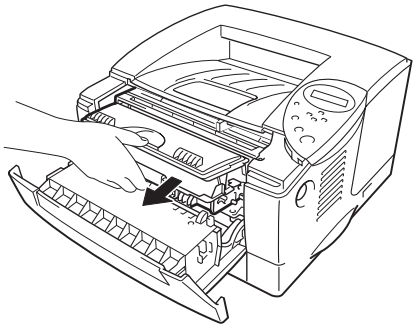
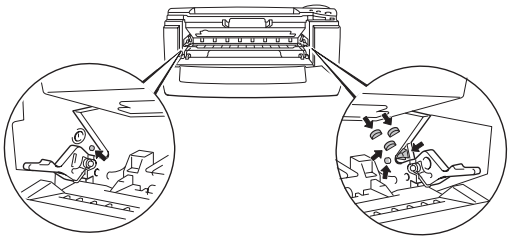


Fig. 5-19

Caution

- We recommend that you place the Drum unit assembly on a piece of disposable paper or cloth in case you accidentally spill or scatter toner.
- To prevent damage to the printer from static electricity, do not touch the electrodes shown below.



3. Clean the primary corona wire inside the Drum unit by gently sliding the blue tab from right to left several times. Return the tab to the Home position before re-installing the Drum unit assembly.

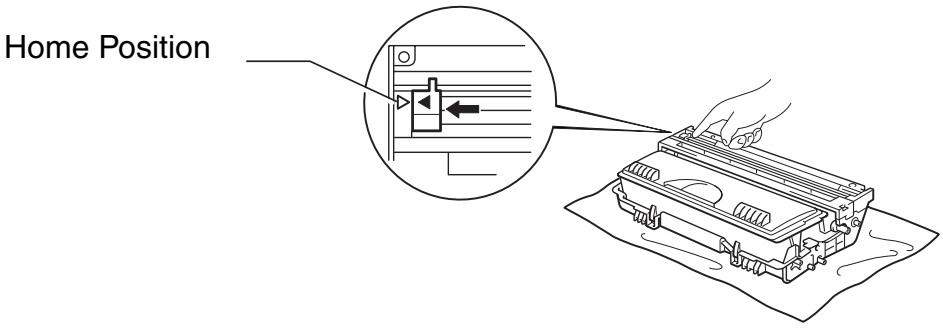


Fig. 5-20

Caution

Be sure to position the tab to the Home position, or printed pages may have vertical stripes.

☛ **4.** Re-install the Drum unit assembly into the printer.

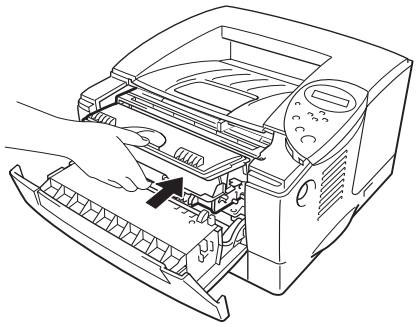


Fig. 5-21

☛ **5.** Close the Front cover.

Maintenance messages

This printer periodically prompts you to replace parts so you can rely upon it to maintain optimum print quality.

LCD message	Item	Approximate life	To purchase replacement
REPLACE FUSER	Fixing unit	80,000 pages [*1]	Call Customer Support
REPLACE PF KIT1	Paper feeding kit	50,000 pages [*1]	Call Customer Support
REPLACE PF KIT2	Paper feeding kit	50,000 pages [*1]	Call Customer Support
REPLACE LASER	Scanner unit	200,000 pages [*1]	Call Customer Support

[*1] At 5% coverage print (A4-Letter size). The actual number of printed pages may vary depending on your average type of print job and paper.

CHAPTER 6 TROUBLESHOOTING

LCD messages

Error messages

Operator Call Message	Action
TONER EMPTY	Replace the Toner cartridge with a new one. See “Replacing the Toner cartridge” in Chapter 5.
NO PAPER XXXX	Load paper into the indicated printer tray.
COVER OPEN	Close the Front cover.
FUSER OPEN	Close the Jam clear cover. See illustration of the Jam clear cover in this chapter.
FACE UP OPEN	Close the Face up output tray.
JAM XXXXXX	Remove the jammed paper from the indicated area. See “Paper jams and how to clear them".
MANUAL FEED	Load the correct size of paper on the Multi-purpose tray, and then press the Go switch.
BUFFER ERROR	Check the Interface setting.
STORAGE FULL	Delete unnecessary macros or fonts.
DOWNLOAD FULL	Add the optional memory. See “Installing additional memory” in Chapter 4.
FONT FULL	Add the optional memory. See “Installing additional memory” in Chapter 4.

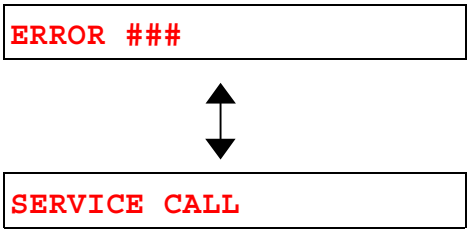
Operator Call Message	Action
MEMORY FULL	Add the optional memory. See “Installing additional memory” in Chapter 4.
PRINT OVERRUN	• Reduce the resolution, or add the optional memory. See “Installing additional memory” in Chapter 4. • Set Page Protect to correct size.
IGNORE DATA	Send correct data to the printer.
SIZE ERROR DX	Specify the printable paper size.
NO DX TRAY	Install the Duplex tray correctly.
DX LEVER ERROR	Set Paper adjustment lever for duplex printing.
NO TRAY1	Install Paper cassette (standard) into Tray 1.
CLEAN DRUM UNIT	Clean the corona wire. See "Cleaning the corona wire" in Chapter 5.

Maintenance messages

Warning Message	Action
CHANGE DRUM SOON	The Drum unit is almost at the end of life. Prepare a new Drum unit. See “CHANGE DRUM SOON message” in Chapter 5.
TONER LOW	Prepare a new Toner cartridge. See “TONER LOW message” in Chapter 5.
REPLACE PF KIT1/2	See “Maintenance messages ” in Chapter 5.
REPLACE FUSER KIT	See “Maintenance messages ” in Chapter 5.
REPLACE LASER KIT	See “Maintenance messages ” in Chapter 5.

Service call messages

When any of the following messages appear on the LCD, turn the printer Off, wait 5 seconds, and then turn the printer On again. If this does not clear the problem, consult your dealer or a Brother authorized service representative.



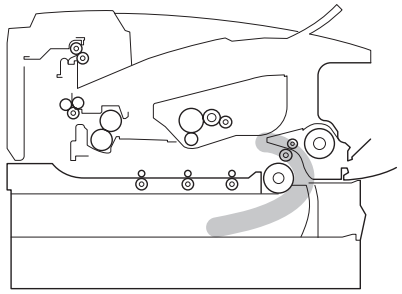
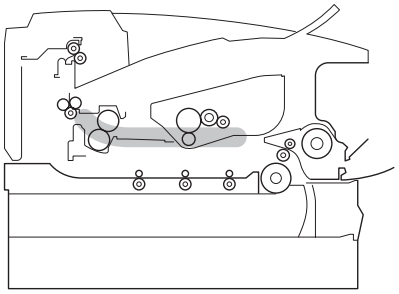
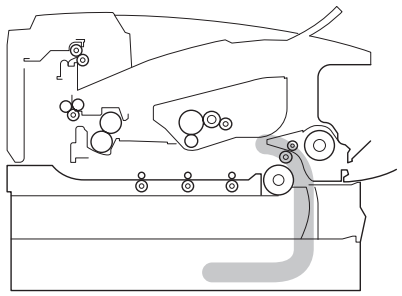
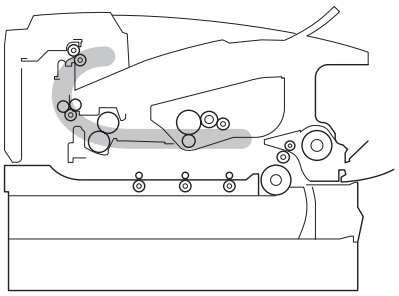
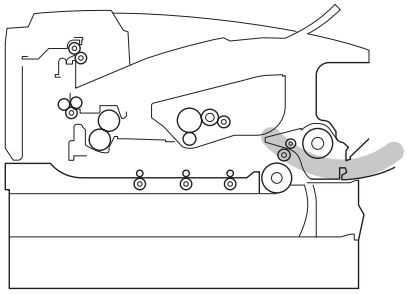
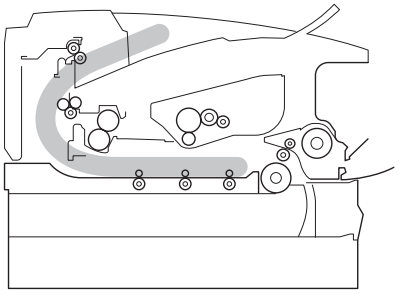
Troubleshooting paper handling

First, ensure that you are using paper that meets the recommended paper specifications. See “What kind of paper can I use?” in Chapter 1.

Problem	Recommendation
The printer does not load paper.	• If there is paper in the paper cassette, make sure it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and place it back into the paper cassette. • Reduce the amount of paper in the paper cassette, and then try again. • Make sure that MANUAL FEED = ON (STOP) is not selected on the Control panel.
The printer does not load paper from the Multi-purpose tray.	• Fan the paper, and then re-install the paper firmly. • Make sure that MANUAL FEED = ON (STOP) is not selected on the Control panel.
The printer does not load envelopes.	• The printer can load envelopes from the Multi-purpose tray. Your application software must be set up correctly to print on the envelope size you are using. This is usually done in the page setup or document setup menu of your software. Refer to your software application manual.
A paper jam has occurred.	• Clear the jammed paper referring to “Paper jams and how to clear them” in this chapter.
The printer does not print into the Face down output tray.	• Close the Face up output tray.
The printed pages are curled, so the Face down output tray can not hold the prescribed number of pages.	• Turn the paper in the Paper cassette over. • Change the printer driver setting in Media Type to a thicker level setting than current setting.
The printer does not print on the specified paper.	• Make sure that the cable is connected to the printer • Make sure that the appropriate printer driver is selected.

Paper jams and how to clear them

If paper jams in the printer, it will stop printing and display the following messages.
The shaded areas in the following illustrations show the location of the jammed paper.

JAM TRAY1	JAM INSIDE
	
JAM TRAY2	**JAM REAR**
	
JAM MP TRAY	**JAM DUPLEX**
	
PAPER JAM	
If you see the “PAPER JAM” error message there are several possible places that the paper could have jammed. See the “PAPER JAM” section in this chapter for more information.	

Check the jam location and follow the instructions to remove the jammed paper.

After you have followed the instructions, the printer will automatically resume printing.

JAM TRAY1

JAM TRAY1

Follow the instructions below to clear a paper jam:

☛ **1.** Pull the Paper cassette completely out of the printer.

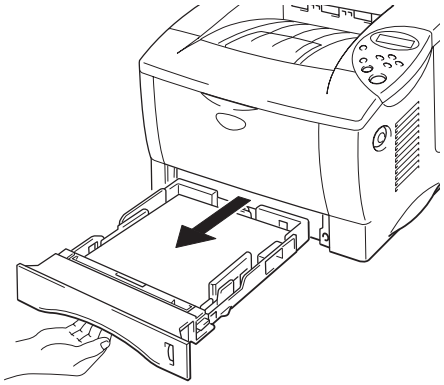


Fig. 6-1

☛ **2.** Pull the jammed paper out of the printer.

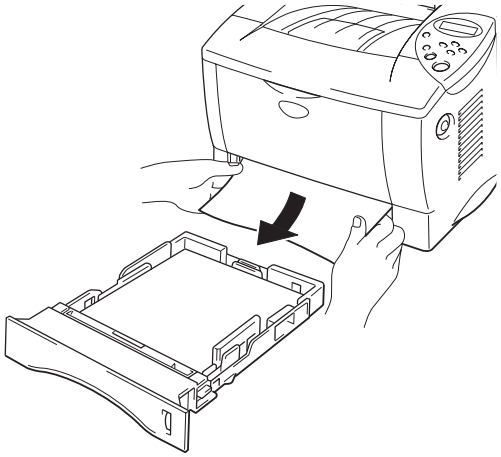


Fig. 6-2

☛ **3.** Install the paper cassette into the printer.

Caution

Do not pull out the standard Paper cassette while paper is being fed from the optional Lower paper cassette because it will cause a paper jam.

JAM TRAY2

JAM TRAY2

Follow the instructions below to clear the paper jam:

☛ **1.** Pull the Lower paper cassette completely out of the printer.

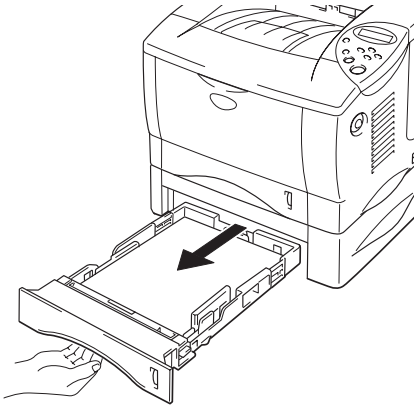


Fig. 6-3

☛ **2.** Using both hands, pull the jammed paper out of the printer.

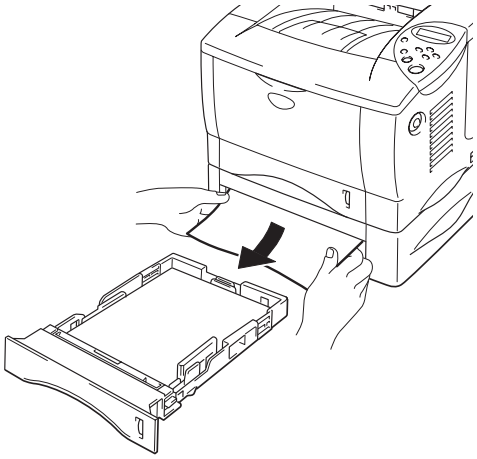


Fig. 6-4

☛ **3.** Install the Lower paper cassette into the printer.

JAM MP TRAY

JAM MP TRAY

Follow the instructions below to clear a paper jam:

☛ **1.** Remove the jammed paper from the Multi-purpose tray.

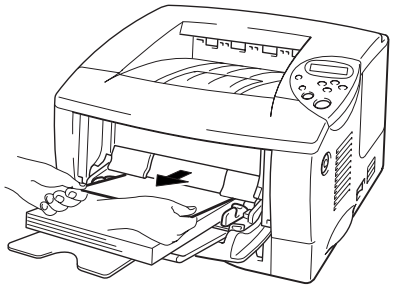


Fig. 6-5

☛ **2.** Reset all the paper into the Multi-purpose tray correctly.

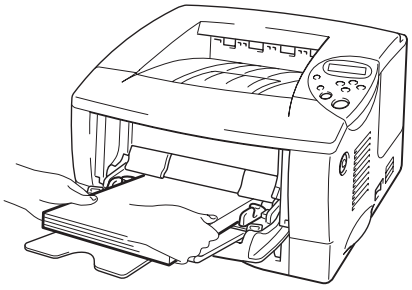


Fig. 6-6

JAM INSIDE

JAM INSIDE

Follow the instructions below to clear the paper jam:

☛ **1.** Press the Cover release button, and then open the Front cover.

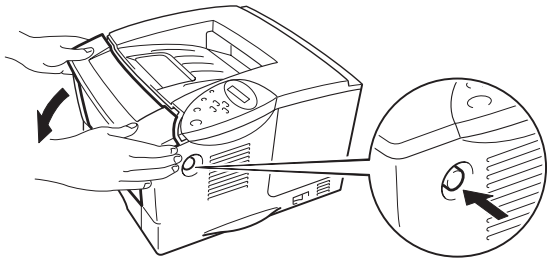


Fig. 6-7

☛ **2.** Pull the Drum unit assembly out of the printer. Pull the Paper cassette completely out of the printer.

☛ **3.** Pull the jammed paper up and out of the printer.

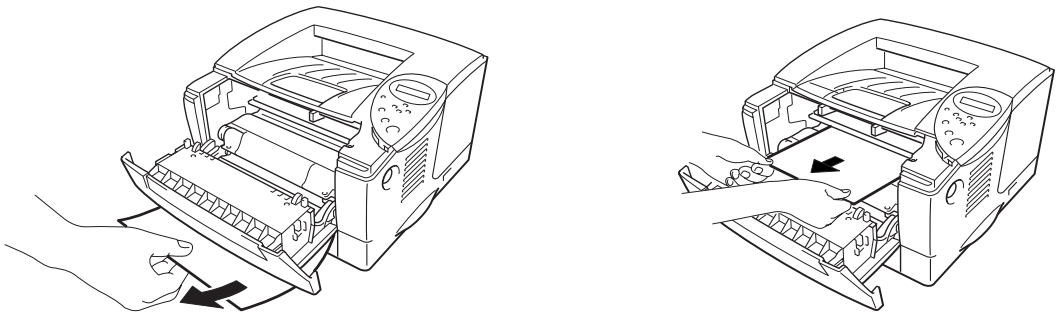


Fig. 6-8

Warning

The fixing roller is extremely **hot** during operation. Remove the paper carefully.

Caution

- After having removed the jammed paper, if the printed page has a stain, print several pages before restarting your print job.
- Remove the jammed paper carefully so you don't spread toner.
- Take care not to stain your hands and clothes with toner. Immediately wash toner stains with cold water.
- Never touch the transfer roller.

☛ **4.** Install the Drum unit assembly and Paper cassette into the printer. Close the Front cover.

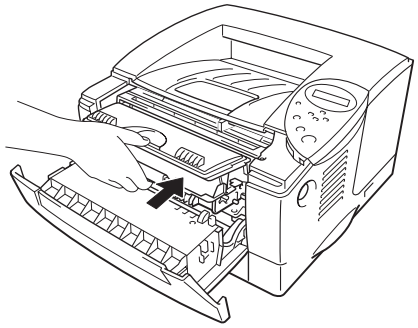


Fig. 6-9

JAM REAR

JAM REAR

Follow the instructions below to clear a paper jam:

☛ **1.** Press the Cover release button, and then open the Front cover.

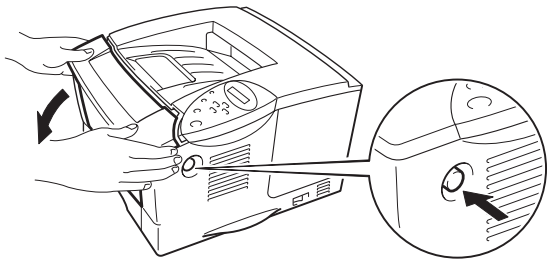


Fig. 6-10

☛ **2.** Pull the Drum unit assembly out of the printer.

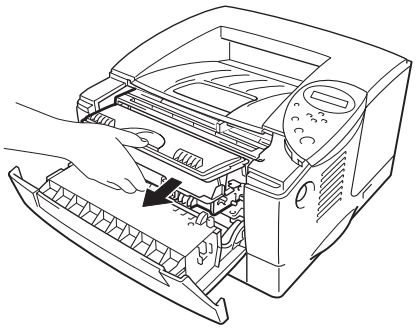
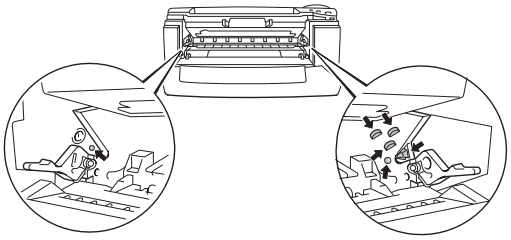


Fig. 6-11

Caution

- We recommend that you put the Drum unit assembly on a piece of disposable paper or cloth so you don't accidentally spill or scatter toner.
- To prevent damage to the printer caused by static electricity, do not touch the electrodes shown below.



☛ **3.** Pull the jammed paper out of the printer.

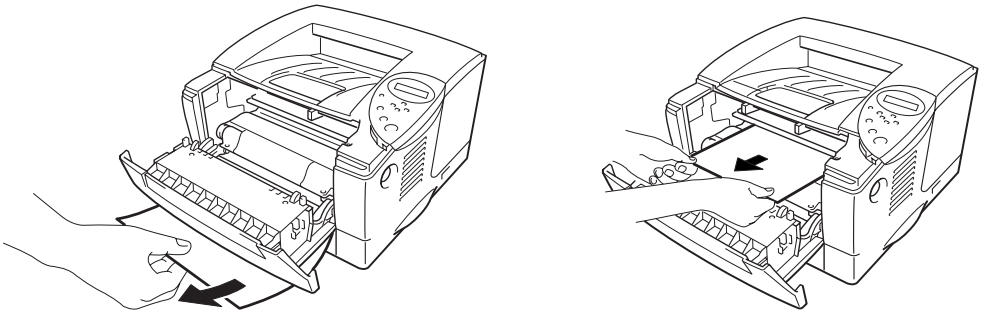


Fig. 6-12

If the paper jam can be cleared, go to Step 7.

☛ **4.** Open the Face up output tray.

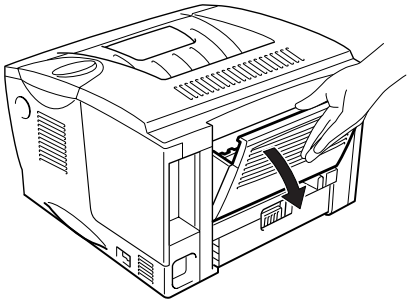
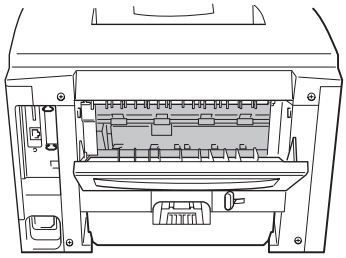


Fig. 6-13

Caution

After you have just used the printer, some internal parts of the printer are extremely **hot!** Wait for the printer to cool down before you touch the internal parts of the printer.



☛ **5.** Open the Jam clear cover. Pull the jammed paper out of the fuser unit.

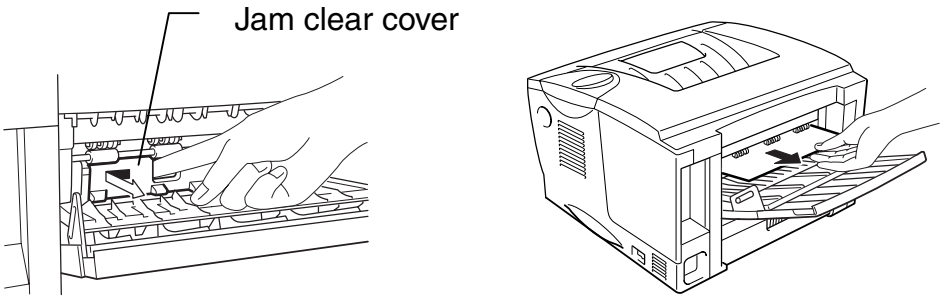


Fig. 6-14

☛ **6.** Close the Jam clear cover. Close the Face up output tray.

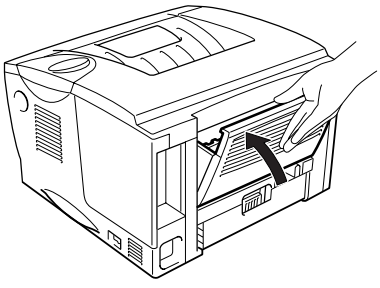


Fig. 6-15

☛ **7.** Install the Drum unit assembly into the printer.

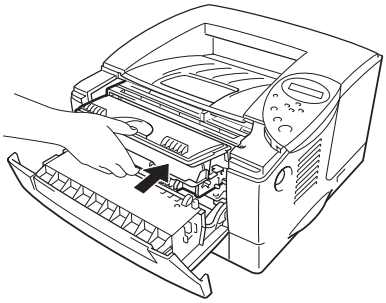


Fig. 6-16

☛ **8.** Close the Front cover.

JAM DUPLEX

JAM DUPLEX

Follow the instructions below to clear a paper jam:

☛ **1.** Open the Face up output tray.

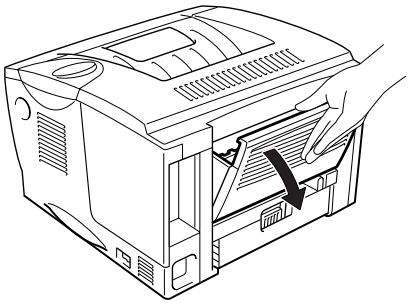


Fig. 6-17

☛ **2.** Pull the jammed paper out of the fuser unit.

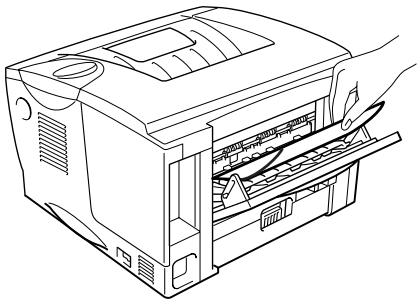


Fig. 6-18

☛ **3.** Close the Face up output tray.

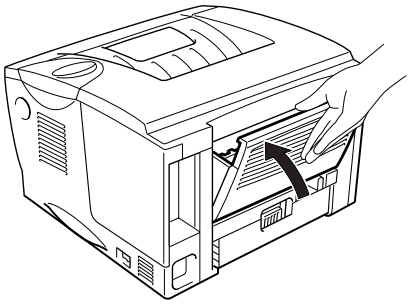


Fig. 6-19

If the paper jam cannot be cleared, go to the next step.

☛ **4.** Pull the Duplex tray and Paper cassette out of the printer.

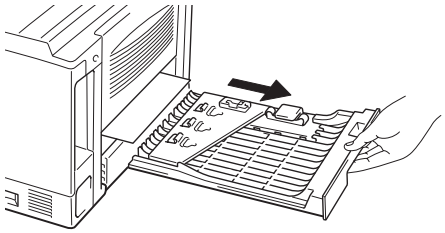


Fig. 6-20

☛ **5.** Pull the jammed paper out of the printer.

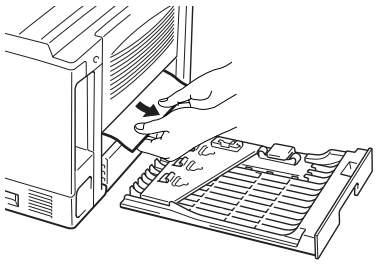


Fig. 6-21

6. Install the Duplex tray and Paper cassette into the printer.

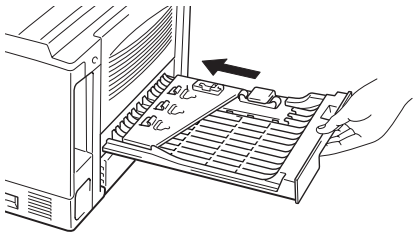


Fig. 6-22

Note

- The JAM DUPLEX message appears if you remove a sheet of paper from the Face down output tray after only one side has printed.
- The paper sizes you can use for the Duplex Printing function are A4, Letter and Legal.
- If the Paper adjustment lever for duplex printing is not set correctly for the paper size, paper jams may occur and the printing will be out of position on the page.

PAPER JAM

PAPER JAM

Follow the instructions below to clear a paper jam:

☛ **1.** Pull the Paper cassette completely out of the printer.

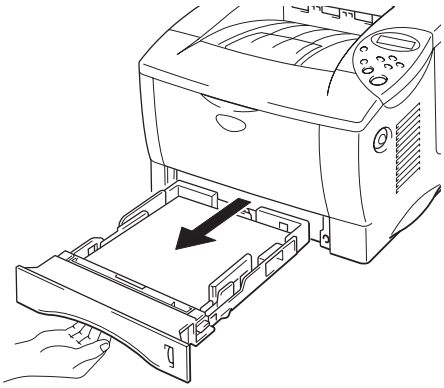


Fig. 6-23

☛ **2.** Pull the jammed paper out of the printer.

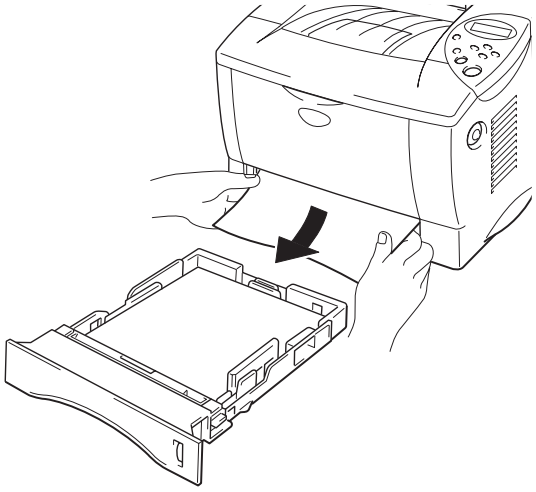


Fig. 6-24

If the paper jam can be cleared, go to Step 10.

☛ **3.** Press the Cover release button, and then open the Front cover.

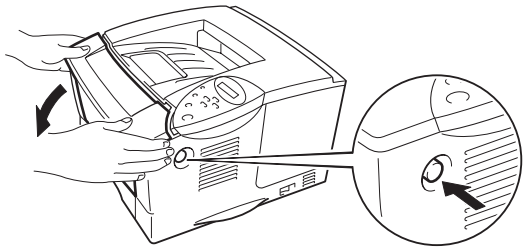


Fig. 6-25

☛ **4.** Pull the Drum unit assembly out of the printer. Pull the jammed paper up and out of the printer

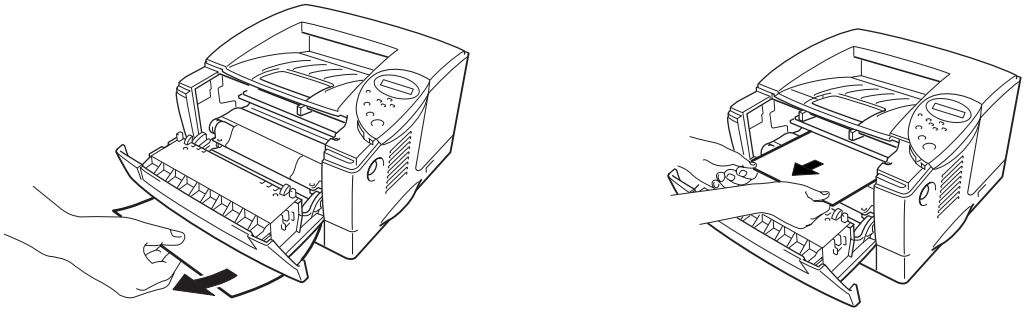


Fig. 6-26

If the paper jam can be cleared, go to Step 8.

☛ **5.** Open the Face up output tray.

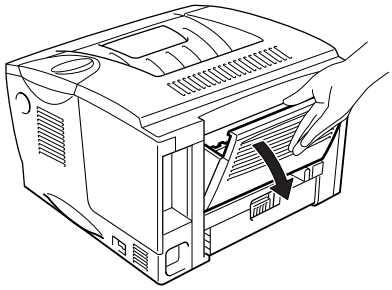


Fig. 6-27

☛ **6.** Open the Jam clear cover. Pull the jammed paper out of the fuser unit.

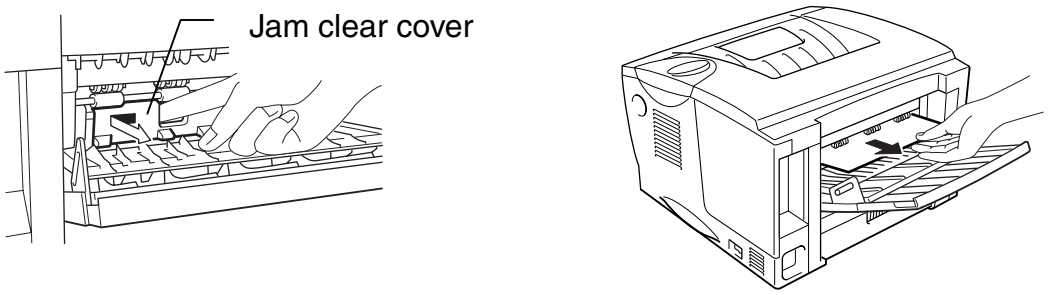


Fig. 6-28

☛ **7.** Close the Jam clear cover. Close the Face up output tray.

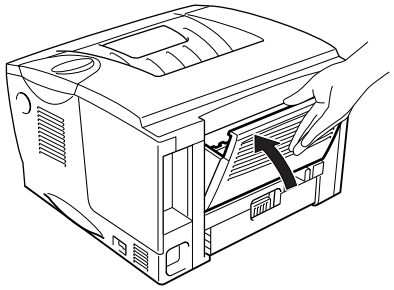


Fig. 6-29

☛ **8.** Install the Drum unit assembly into the printer.

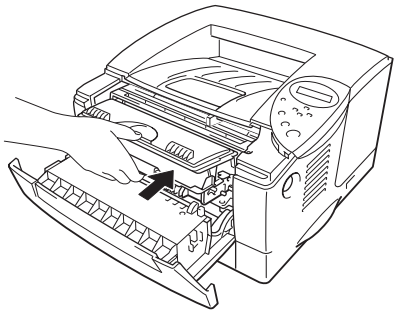


Fig. 6-30

☛ **9.** Close the Front cover.

☛ **10.** Install the paper cassette into the printer.

Improving the print quality

This section provides information on the following topics:

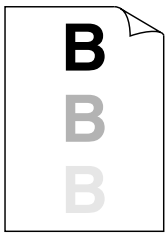
Image defect examples	Recommendation
 Faint	• Check the printer's environment. Conditions such as humidity, high temperatures, etc. may cause this print defect to occur. See “Place the printer” in Chapter 1. • If the whole page is too light, toner save mode may be on. Disable toner save mode in the Printer Properties tab of the Driver. • Try installing a new Toner cartridge. See “Replacing the Toner cartridge” in Chapter 5.
 Gray background	• Make sure you use paper that meets the recommended specifications. See “Recommended paper” in Chapter 1. • Check the printer's environment; high temperature and high humidity conditions can increase the amount of background shading. See “Positioning the printer” in Chapter 1. • Installing a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5.
 **Ghost**	• Make sure you use paper that meets the specifications. A rough surfaced paper, paper that has absorbed moisture or thick media can cause the problem. See “What kind of paper can I use ?” in Chapter 1. • Make sure that you select the appropriate media type in the printer driver. See “What kind of paper can I use?” in Chapter 1. • Try installing a new Toner cartridge. See “Replacing the Toner cartridge” in Chapter 5.

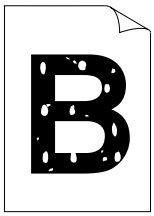
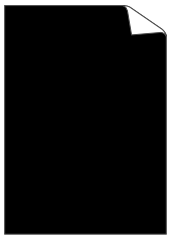
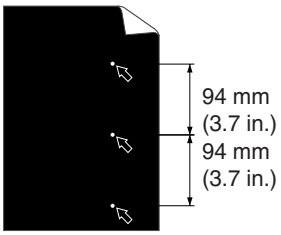
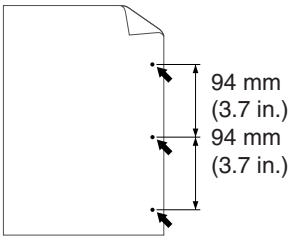
Image defect examples	Recommendation
 Toner specks	• Make sure you use paper that meets the specifications. Rough surfaced paper may cause this problem. See “What kind of paper can I use?” in Chapter 1. • The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5.
 **Hollow print**	• Make sure you use paper that meets the specifications. See “What kind of paper can I use” in Chapter 1. • Select the ‘Thick paper mode’ in the printer driver, or use Thinner paper than you are currently using. • Check the printer’s environment because conditions such as high humidity may cause this situation to occur. See “Positioning the printer” in Chapter 1.
 **All black**	• The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5. • Clean the corona wire. See "Cleaning the corona wire" in Chapter 5.

Image defect examples	Recommendation



White Spots

Printed pages have white spots in black text and graphics at intervals of 94 mm (3.7 in.).



Black Spots

Printed pages have black spots at intervals of 94 mm (3.7 in.).

- If the problem is not solved after printing a few pages, the drum unit may have glue from label stock on the OPC drum surface.
- Clean the drum unit as follows:

1. Position the print sample in front of the drum unit, and find the exact position of the image defect.

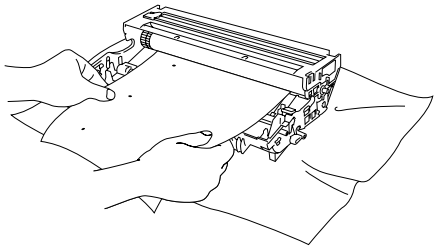


Fig. 6-31

2. Turn the drum unit gear by hand while looking at the surface of the OPC drum.

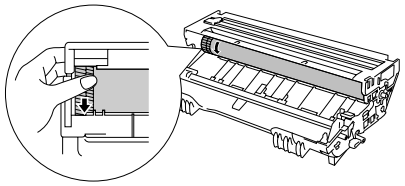


Fig. 6-32

3. When you have located the mark on the drum that matches the print sample, wipe the surface of the OPC drum with a cotton swab until the dust or paper powder on the surface comes off.

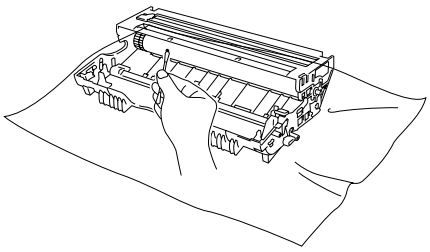


Fig. 6-33

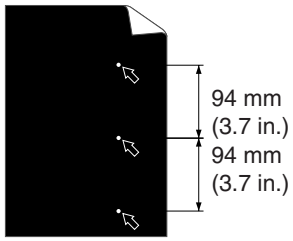
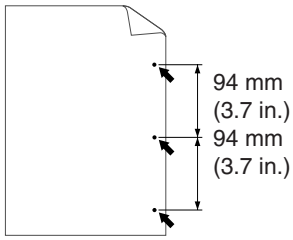
Image defect examples	Recommendation
 **White Spots** Printed pages have white spots in black text and graphics at intervals of 94 mm (3.7 in.).	**Caution** Do not try to clean the surface of the photosensitive drum with anything sharp, such as ball-point pen, etc. • The Toner cartridge may be damaged. Install a new Toner cartridge. See “Replacing the Toner cartridge” in Chapter 5.
 Printed pages have black spots at intervals of 94 mm (3.7 in.).	

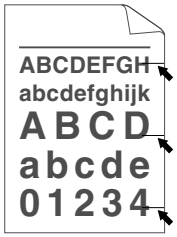
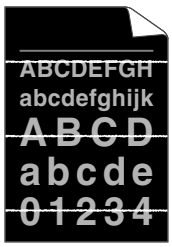
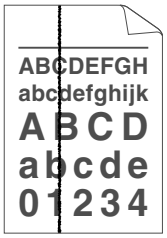
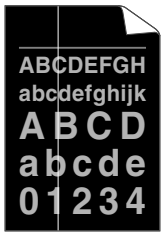
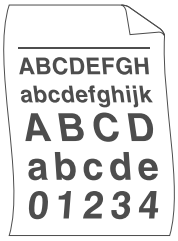
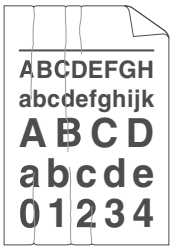
Image defect examples	Recommendation
 **Black Horizontal repetitive defects** Toner scatters and stains the printed page.	• The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5. • Make sure you use paper that meets specifications. See “What kind of paper can I use?” in Chapter 1. **Note** • If you use label sheets for laser printers, the glue from the sheets may sometimes stick to the OPC drum surface. Clean the drum unit. See the previous page. • Do not use paper that has clips or staples because they will scratch the surface of the drum. • If the unpacked drum unit is subject to excessive direct sunlight or room light, the unit may be damaged.
 **White horizontal stripes**	• Make sure you use paper that meets the specifications. Rough surfaced paper or thick media can cause the problem. See “What kind of paper can I use” in Chapter 1. • Make sure you select the appropriate media type in the printer driver. • The problem may disappear by itself. Try printing multiple pages to clear this problem especially if the printer has not been used for a long time. • The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5.
 Horizontal Lines	• The drum unit may be damaged. Install a new Drum unit. See "Replacing the Drum unit" in Chapter 5.
 Black Vertical lines **Printed pages are stained with toner or have vertical stripes.**	• The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5. • Make sure that a torn piece of paper is not inside the printer covering the scanner window. • The fixing unit may be smudged. Call Customer Support. • Clean the corona wire. See "Cleaning the corona wire" in Chapter 5. • Return the tab to the home position.

Image defect examples	Recommendation
 White Vertical streaks	• You may clear the problem by wiping the scanner window with a soft cloth. See “How to clean the printer” in Chapter 5. • The Toner cartridge may be damaged. Install a new Toner cartridge. See "Replacing the Toner cartridge" in Chapter 5.
 Page skew	• Make sure the paper or other media is loaded into the paper cassette correctly and that the guides are not too tight or too loose against the paper stack. • Set the paper guides correctly. Make sure that the tips of the paper guides fit into the slot correctly. See “Printing from the Paper cassette” in Chapter 1. • If you are using the Multi-purpose tray, see "Printing from the Multi-purpose tray" in Chapter 1. • The paper cassette may be too full. See “Printing from the Paper cassette” in Chapter 1 • Check the paper type and quality. See "What kind of paper can I use?" in Chapter 1.
 Curl or wave	• Check the paper type and quality. Both high temperature and humidity will cause paper to curl. See “What kind of paper can I use?” in Chapter 1. • If you use the printer infrequently, the paper may have sat for too long in the paper cassette. Turn over the stack of paper in the paper cassette. Also, try rotating the paper 180° in the paper cassette.
 Wrinkles or creases	• Make sure that paper is loaded properly. See “Printing from the Paper cassette” in Chapter 1. • Check the paper type and quality. See “What kind of paper can I use” in Chapter 1. • Turn over the stack of paper in the tray or try rotating the paper 180° in the tray.

How to print correctly

Problem	Recommendation
The printer prints unexpectedly or it prints garbage.	• Make sure the printer cable is not too long. We recommend you use a parallel cable of less than 2 metres (6 1/2 feet) in length. • Check if the printer cable is damaged or broken. • If you are using an interface switching device, remove it and then connect your computer directly to your printer and try again. • Check that the appropriate printer driver is selected in 'Set as Default'. • Check that the printer is not connected to the same port that is also connected to a mass storage device or scanner. Remove all other devices and connect the port to the printer only. • Turn off the status monitor in the Device / Options page on the Advanced tab in the printer driver.

The printer cannot print full pages of a document. An error message "PRINT OVERRUN" occurs.	• Press the Go switch to print the data remaining in the printer.
	• If this does not clear the error, reduce the complexity of your document or reduce the print resolution.
	• Change the following settings in the supplied Windows® driver and then try again. The best combination of settings below will vary depending on your document.
	  • Graphics Mode
	  • True Type mode
	  • Use Printer True Type Fonts

The printer cannot print full pages of a document. A "MEMORY FULL" error message occurs.	• Press the Go switch to print the data remaining in the printer. • Reduce the print resolution or reduce the complexity of your document. • Expand the printer memory by adding a commercially available DIMM. Refer to 'RAM expansion' in Chapter 4.

Problem	Recommendation
My headers or footers appear when I view my document on screen but do not show up on printed pages.	• Most laser printers have a restricted area that cannot be printed on. Usually the first two lines and the last two lines of a page cannot have print (leaving 62 printable lines). Adjust the top and bottom margins in your document to allow for this.

Other problems

Problem	Recommendation
The printer cannot print. "There was an error writing to LPT1: (or BRUSB) for the printer." error message occurs on your PC.	• Check that the printer cable is not damaged or broken. • Make sure the correct printer is selected if you have an interface switching device.

For DOS users

Problem	Recommendation
Unable to print from application software.	• Check that the DOS application software interface settings match that of your printer: For example, if you are using a parallel printer cable, you would most likely set your DOS software printer port to LPT1. • Check if the printer has any printer alarms. • Check if the appropriate printer is selected in your application software.

BR-Script 3 language

Problem	Recommendation
The printer cannot print.	If “IGNORE DATA” appears on the LCD message, please do the following. 1. Reset the printer. 2. Set the “ERRORPRINT” ON, and print again. 3. If the Error is “LIMITCHECK”, add the optional memory. See “Installing additional memory” in Chapter 4.
The print speed slows down.	Add the optional memory. See “Installing additional memory” in Chapter 4.
The printer cannot print EPS data.	You need the following settings to print this type of data. 1. Select the printer you use in the Printer folder. 2. Press the “Advanced” button on the PostScript tab. 3. Select the “Tagged binary communication protocol” in the Data format section.

APPENDIX

Printer specifications

ENGINE		
Technology		Electrophotographic
Print Speed	Normal	Up to 16 ppm
	Duplex Printing	Up to 7.5 ppm
Warm Up Time		Less than 25 sec[*1]
First Print Time		Less than 15 sec[*2]
Resolution	Windows® 95 / 98 Me, Windows NT® 4.0 and Windows® 2000	HQ1200[*3] 600 dpi 300 dpi
	DOS	600 dpi
	Mac OS	HQ1200[*3] 600 dpi 300 dpi
	HRC[*4]	For 300 / 600 dpi
	APT[*5]	Yes (Windows® only)

CONTROLLER			
Processor			Fujitsu MB86834 100MHz
Memory	Standard	HL-1650	8MB
		HL-1670N	16MB
	Option	HL-1650	1 DIMM (100pin) slot (16, 32, 64, 128MB) ; expandable up to 136MB
		HL-1670N	1 DIMM (100pin) slot (16, 32, 64, 128MB) ; expandable up to 144MB
Interface	Standard	HL-1650	IEEE 1284 Parallel, USB,
		HL-1670N	IEEE 1284 Parallel, USB, 10/100 Base TX (NC-4100h)
	Option	HL-1650	10/100 Base TX (NC-4100h), IrDA (IR-1000)
		HL-1670N	IrDA (IR-1000)
Network Connectivity	Interface		10/100 Base TX (option for HL-1650, standard for HL-1670N)
	Protocol		TCP/IP, EtherTalk, IPX/SPX, DEC LAT, Banyan VINES, NetBEUI, DLC/LLC
	Management tool		BRAdmin Professional[*6] Web Based Management[*7]
Emulation			PCL6, BR-Script 3[*8], IBM Proprinter XL, Epson FX-850
Resident Fonts	PCL		66 scalable fonts, 12 bitmap fonts, 11 bar codes[*9]
	BR-Script 3[*8]		66 fonts
	Option		136 Agfa PS3 fonts[*10]

SOFTWARE		
Printer Driver		PCL Driver for Windows® 95 / 98 / Me, Windows NT® 4.0, Windows® 2000
		BR-Script 3[*8] (PPD file for Windows® 95 / 98 / Me, Windows NT® 4.0, Windows® 2000 and Macintosh[*11])
		Special Driver for Macintosh[*12]
Utility Software		Automatic E-mail Printing[*13]
		Internet Print software[*14]
		Storage Manager[*15]
CONTROL PANEL		
Display	LCD	1 line,16 Digits, 3 colors
	LED	1 LED
Switches	7 Keys	Go, Job Cancel, Reprint, Menu, Back, and 2 scroll switches

PRINTER DRIVER FUNCTIONS[*15]		
Page Layout	N-up Printing	2, 4, 9, 16, 25 in 1 page
	Poster Printing	1 in 4, 9, 16, 25
	Watermark Printing	Yes
Others		Quick Print Setup[*16]

SUPPLIES	
Toner	6,500 A4/LTR pages @5% coverage
Drum	20,000 A4/LTR pages (1 page / job)

DIMENSIONS / WEIGHTS		
Dimensions		16.0" (W) x 16.7" (D) x 10.8"(H) (406 x 424 x 275 mm)
Weights	HL-1650	Approx. 14.5 kg (32.0 lbs.) including the drum unit and toner cartridge
	HL-1670N	Approx. 14.7 kg (32.4 lbs.) including the drum unit and toner cartridge

OTHERS		
Power Consumption	Printing	Less than 360 W
	Standby	Less than 80 W
	Sleep	Less than 12 W
Noise Level	Printing	Less than 53 dB
	Standby	Less than 30 dB
Ecology	Power Saving	Yes
	Toner Saving	Yes

*1 23°C (73.4°F)
*2 From standard Paper cassette
*3 Brother HQ1200 technology provides the best print quality while printing at full engine speed.
*4 High Resolution Control
*5 Advanced Photoscale Technology
*6 Original Windows® utility for print server management
*7 Printer and print server management through Web browser
*8 PostScript 3 language emulation
*9 Code39, Interleaved 2 of 5, EAN-8, EAN-13, UPC-A, UPC-E, EAN-128, Codabar, FIM(US-PostNet), ISBN, Code128
*10 Total number of PS3 fonts is 165 (136 Agfa fonts + 29 original fonts)
*11 EtherTalk only
*12 Mac OS8 or later and USB interface required
*13 Utility software that automatically prints specified e-mail message at prescheduled time. (For Windows 95 / 98 / Me)
*14 Utility software to print on this printer from a remote computer via the internet. (For Windows® 95 / 98 / Me, NT® 4.0 / 2000)
*15 Utility software to manage fonts and macros (electronic forms) stored in the printer memory. (For Windows® 95 / 98 / Me, NT® 4.0 / 2000)
*16 A printer driver function that enables you to change the driver settings without opening the Property dialog.

Print media and size

The Paper trays and LCD panel descriptions in this manual are named as shown below.

Upper paper tray	Tray 1
Multi-purpose tray	MP tray
Optional Lower tray	Tray 2

The printer loads paper from either the installed Multi-purpose tray, Upper paper tray or optional Lower paper tray.

Media type	***Tray 1***	***MP tray***	***Tray 2***	***Duplex printing***	***Select the Media type in the printer driver***
Plain paper	✓	✓	✓	✓	Plain paper
Recycled paper	✓	✓	✓	✓	Plain paper
Bond paper		✓			Bond paper
Thick paper		✓			Thick paper or Thicker paper
Transparencies	✓ up to 10 sheets	✓ Only A4, Letter			Transparencies
Label		✓ Only A4, Letter			Plain paper
Envelopes		✓			Envelopes
Card Stock		✓			Thick paper or Thicker paper

	Upper paper tray (Tray 1)	*Multi-purpose tray (MP tray)*	*Optional Lower tray unit (Tray 2)*	*Duplex printing*
Paper size	A4, Letter, Legal, 8.5 x 13 in., B5 (JIS), B5 (ISO), Executive, A5, A6, B6	Width: 70 to 216 mm (215 to 8.5 in.) Length: 116 to 356 mm (4.57 to 14.0 in.)	A4, Letter, Legal, B5 (JIS), B5 (ISO), Executive, A5	A4, Letter, Legal
Capacity	250 sheets (80 g/m^2 or 21 lbs.)	100 sheets (80 g/m^2 or 21 lbs.) Legal : 30 8.5 x 13 in. : 30 labels : 10	250 sheets (80 g/m^2 or 21 lbs.)	

We recommend the following print methods (output tray) for each paper media type:

Media type	***Paper output***		***Notes***
	Face down	***Face up***	
Plain paper	✓	✓	60 g/m^2 to 105 g/m^2 (16 to 28 lbs.)
Thick paper		✓	105 g/m^2 to 161 g/m^2 (28 to 43 lbs.)
Recycled paper	✓	✓	
Transparencies	✓		OHP films
Label		✓	
Envelopes		✓	
Card Stock		✓	

You can select the priority of the paper source in the Paper Menu on the Control Panel.
For more information about the paper settings, see Chapter 3.

What is important when you choose paper to use with this printer

♦ *Before you purchase a large quantity of paper*

Make sure that the paper is suitable for the printer.

♦ *Paper for plain paper copy*

Paper is divided by usage, such as paper for printing and paper for copying. The usage is usually specified on the paper's package. Check the package to see whether it is suitable for laser printers. Use paper that is suitable for laser printers.

♦ *Basis weight*

The basis weight of the paper in general use varies in different countries. We recommend that you use paper that weighs 75 g/m^2 to 90 g/m^2 (20 to 24 lb.), although this printer is able to cope with thinner or thicker paper than these weights.

Unit	Europe	USA
g/m^2	80 to 90	75 to 90
lb		20 to 24

♦ *Long grain and short grain*

The pulp fiber of the paper is aligned during paper manufacture. What we call long grain paper is paper where the fibre is parallel to the paper carriage direction of the paper.

Paper can be classified into two types, long grain and short grain. Long grain paper's fibre direction is parallel to the carriage direction of the paper in the printer. Short grain paper's fibre direction is vertical to the carriage direction of the paper in the printer. Though most plain paper for copying is long grain, some is short grain. We recommend that you use long grain paper for this printer. Short grain paper is too weak for the paper carriage of the printer.

♦ *Acid paper and neutralized paper*

Paper can be classified as either acid paper or neutralized paper.
Though modern paper manufacture methods started with acid paper, recently neutralized paper is taking the place of acid paper because of environment or preservation issues. However, many forms of acid paper can be found in recycled paper.We recommend that you use neutralized paper for this printer.
You can use an acid paper check pen to distinguish acid paper from neutral paper.

♦ *Print surface*

The characteristics may differ a little between the face side and reverse side of a sheet of paper.
Usually, the opening side of the ream of paper package is the print side. Follow any indication of the print side on the paper package. Typically, the paper side is indicated with an arrow.

♦ *Moisture content*

Moisture content is the amount of water left in the paper after manufacture. It is one of the important characteristics of the paper. This can change greatly depending on the storage environment, although usually paper contains around 5% water by weight. Because paper often absorbs water, the amount of water can sometimes be about 10% in a high humidity environment. When the amount of water increases, the characteristic of the paper changes greatly. The fixing of the toner may become worse. For storage of the paper and during use, we recommend the humidity of the surrounding environment is between 50 % and 60%.

Rough estimate of basis weight

g/m^2	Lbs	
	Bond	Index
60	16	
64	17	
75	20	
90	24	
105	28	
120	32	
135	36	
161	43	90
200	53	110

Paper size

Letter		8.5 x 11 in.
Folio		8.5 x 13 in.
Legal		8.5 x 14 in.
Executive		7.25 x 10.5 in.
A4	210 x 297 mm	
A5	148 x 210 mm	
A6	105 x 148 mm	
B5 (JIS)	182 x 257 mm	
B6 (JIS)	128 x 182 mm	
B5 (ISO)	201 x 276 mm	
Envelope Monarch		3.875 x 7.5 in.
Envelope #9		3.875 x 8.9 in.
Envelope #10		4.12 x 9.5 in.
Envelope #11		4.5 x 10.375 in.
Envelope DL	110 x 220 mm	
Envelope C5	162 x 229 mm	
Envelope C6	114 x 162 mm	
Envelope B5	176 x 250 mm	
Envelope B6	176 x 125 mm	

Emulation modes

This printer has the following emulation modes:

❖ HP LaserJet mode

This printer uses the HP LaserJet mode (or HP mode) that emulates the Hewlett-Packard LaserJet laser printer. Since many application software packages support the HP LaserJet printer, your printer will operate at its optimum performance in this mode.

❖ BR-Script 3 mode

BR-Script is an original page description language and is a PostScript language emulation interpreter. This printer supports level 3. This BR-Script interpreter enables full and satisfactory control of text and graphics on the pages.

Average users will not need extensive knowledge of the PostScript language. However, if you want to obtain technical information about PostScript commands, see the following commercial manuals:

- Adobe Systems Incorporated. PostScript Language Reference Manual, 2nd Edition. Menlo Park: Addison-Wesley Publishing Company, Inc., 1990.
- Adobe Systems Incorporated. PostScript Language Program Design. Menlo Park: Addison-Wesley Publishing Company, Inc., 1988.
- Adobe Systems Incorporated. PostScript Language Reference Manual. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. PostScript Language Tutorial and Cookbook. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. PostScript Language Reference Manual, third Edition. Addison-Wesley Longman, Inc., 1999.

❖ *EPSON FX-850 and IBM Proprinter XL mode*

The EPSON FX-850 and IBM Proprinter XL modes are the emulation modes this printer uses to emulate the industry-standard dot matrix printers of their respective manufacturer. Since most applications support these printers, you do not have to be concerned about compatibility.

Resident fonts

75 Scalable and 12 Bitmapped fonts

This printer has the following scalable fonts and bitmapped fonts. The fonts that can be used will vary according to the current emulation mode.

❖ HP LaserJet, EPSON FX-850 and IBM Proprinter XL modes

♦ ***Scalable fonts:***

Intellifont compatible fonts:

- Alaska, Extrabold
- Antique Oakland, Oblique, Bold
- Brougham, Oblique, Bold, BoldOblique
- Cleveland Condensed
- Connecticut
- Guatemala Antique, Italic, Bold, BoldItalic
- Letter Gothic, Oblique, Bold
- Maryland
- Oklahoma, Oblique, Bold, BoldOblique
- PC Brussels Light, LightItalic, Demi, DemiItalic
- PC Tennessee Roman, Italic, Bold, BoldItalic
- Utah, Oblique, Bold, BoldOblique
- Utah Condensed, Oblique, Bold, BoldOblique

♦ ***Microsoft Windows 95 TrueType™***

Compatible fonts:

- BR Symbol
- Helsinki, Oblique, Bold, BoldOblique
- Tennessee Roman, Italic, Bold, BoldItalic
- W Dingbats

- ***Type 1 font compatible fonts:***
    - Atlanta Book, BookOblique, Demi, DemiOblique
    - Calgary MediumItalic
    - Copenhagen Roman, Italic, Bold, BoldItalic
    - Portugal Roman, Italic, Bold, BoldItalic

- ***Original fonts:***
    - Bermuda Script
    - Germany
    - San Diego
    - US Roman

- ***Bitmapped fonts (Portrait and Landscape):***
    - LetterGothic16.66 Medium, Italic, Bold, BoldItalic
    - OCR-A
    - OCR-B

❖ BR-Script 3 mode

Scalable Fonts:

- Atlanta Book, BookOblique, Demi, DemiOblique
- Alaska, Extrabold
- Antique Oakland, Oblique, Bold
- Bermuda Script
- BR Dingbats
- BR Symbol
- Brougham, Oblique, Bold, BoldOblique
- Brussels Light, LightItalic, Demi, DemiItalic
- Calgary MediumItalic
- Cleveland Condensed
- Connecticut
- Copenhagen Roman, Italic, Bold, BoldItalic
- Germany
- Guatemala Antique, Italic, Bold, BoldItalic
- Helsinki, Oblique, Bold, BoldOblique
- Helsinki Narrow, Oblique, Bold, BoldOblique
- Letter Gothic, Oblique, Bold
- Maryland
- Oklahoma, Oblique, Bold, Bold Oblique
- Portugal Roman, Italic, Bold, BoldItalic
- San Diego
- Tennessee Roman, Italic, Bold, BoldItalic
- US Roman
- Utah, Oblique, Bold, BoldOblique
- Utah Condensed, Oblique, Bold, BoldOblique

Symbol sets / Character sets

OCR symbol sets

When the OCR-A or OCR-B font is selected, its corresponding symbol set is always used.

- OCR-A
- OCR-B

HP LaserJet mode

- Roman 8 (8U)
- ISO Latin1 (0N) ISO Latin2 (2N)
- ISO Latin5 (5N)
- ISO Latin6 (6N)
- PC-8 (10U)
- PC-8 D/N (11U)
- PC-850 (12U)
- PC-852 (17U)
- PC-775 (26U)
- PC-1004 (9J)
- PC-8 Turkish (9T)
- Windows Latin1 (19U)
- Windows Latin2 (9E)
- Windows Latin5 (5T)
- Windows Baltic (19L)
- Legal (1U)
- Ventura Math (6M)
- Ventura Intl (13J)
- Ventura US (14J)
- PS Math (5M)
- PS Text (10J)
- Math-8 (8M)
- Pi Font (15U)
- MS Publishing (6J)
- Windows 3.0 (9U)
- Desktop (7J)
- MC Text (12J)
- Symbol (19M)
- Windings (579L)
- ISO2 IRV
- ISO4 UK
- ISO6 ASCII
- ISO10 Swedish
- ISO11 Swedish
- ISO14 JIS ASCII
- ISO15 Italian
- ISO16 Portuguese
- ISO17 Spanish
- ISO21 German
- ISO25 French
- ISO57 Chinese
- ISO60 Norwegian1
- ISO61 Norwegian2
- ISO69 French
- ISO84 Portuguese
- ISO85 Spanish
- HP German
- HP Spanish

EPSON mode

- US ASCII
- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish
- German
- UK ASCII I
- French I
- Danish I
- Italy
- Spanish
- Swedish
- Japanese
- Norwegian
- Danish II
- UK ASCII II
- French II
- Dutch
- South African

IBM mode

- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish

Note

If you want to know the characters that are available in each symbol/character set, you can see them in the TABLE PRINT menu in PRINT MENU mode for each emulation. For more information, see Chapter 3.

♦ *HP LaserJet 6P*

Roman 8 (8U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				¯	â	Å	Á	Þ
1			!	1	A	Q	a	q			À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r			Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s			È	°	û	Æ	Đ	µ
4			$	4	D	T	d	t			Ê	Ç	á	å	ð	¶
5			%	5	E	U	e	u			Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v			Î	Ñ	ó	ø	Ì	-
7			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x			´	¡	à	Ä	Ò	½
9			)	9	I	Y	i	y			`	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z			^	¤	ò	Ö	õ	º
B			+	;	K	[	k	{			¨	£	ù	Ü	Š	«
C			,	<	L	\	l	|			~	¥	ä	É	š	■
D			-	=	M	]	m	}			Ù	Ş	ë	ï	Ú	»
E			.	>	N	^	n	~			Û	ƒ	ö	ß	Ÿ	±
F			/	?	O	_	o	▒			£	¢	ü	Ô	ÿ	

ISO Latin1 (0N)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Đ	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒			¯	¿	Ï	ß	ï	ÿ

Windows Latin1 (19U)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	À	Đ	à	ð
1			!	1	A	Q	a	q		'	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r	‚	'	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s	ƒ	"	£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t	„	"	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v	†	–	¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x	^	~	¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y	‰	™	©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z	Š	š	ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Û	ë	û
C			,	<	L	\	l	|	Œ	œ	¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒		Ÿ	¯	¿	Ï	ß	ï	ÿ

Windows Latin2 (9E)

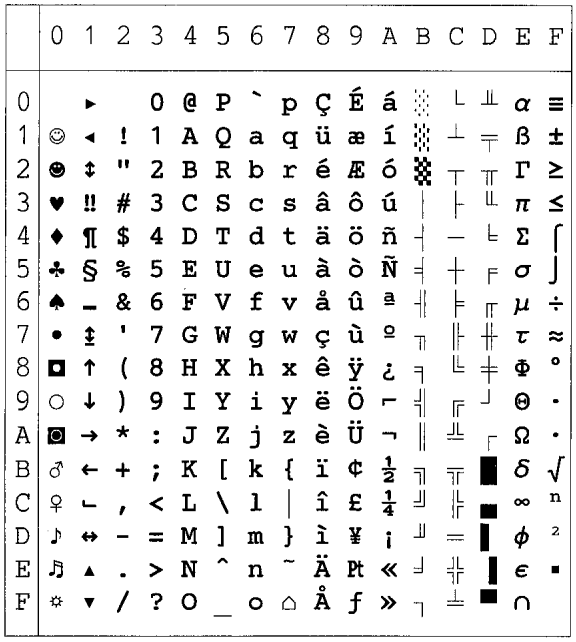
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	€			°	Ŕ	Đ	ŕ	đ
1			!	1	A	Q	a	q		'	ˇ	±	Á	Ń	á	ń
2			"	2	B	R	b	r	,	'	˘	¸	Â	Ň	â	ň
3			#	3	C	S	c	s		"	Ł	ł	Ă	Ó	ă	ó
4			$	4	D	T	d	t	„	"	¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	í	ő
6			&	6	F	V	f	v	†	–	¦	¶	Ć	Ö	ć	ö
7			'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	‹	›	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D			-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	Ľ	Î	Ţ	î	ţ
F			/	?	O	_	o	▒	Ź	ź	Ż	ż	Ď	ß	đ	˙

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the Roman 8 character set. For other characters, see the Roman 8 character set.

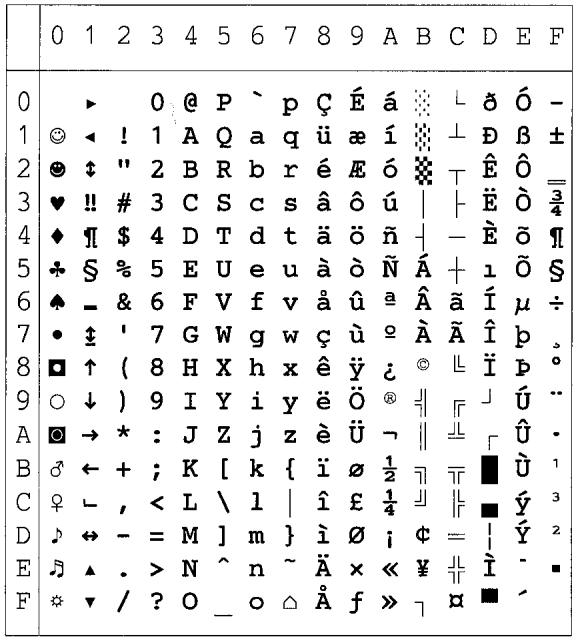
SYMBOL SET		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
ISO2 IRV	<ESC>(2U	#	¤	@	[	\	]	^	`	{	|	}	~
ISO4 UK	<ESC>(1E	£	$	@	[	\	]	^	`	{	|	}	~
ISO6 ASCII	<ESC>(0U	#	$	@	[	\	]	^	`	{	|	}	~
ISO10 Swedish	<ESC>(3S	#	¤	@	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ISO11 Swedish	<ESC>(0S	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ISO14 JIS ASCII	<ESC>(0K	#	$	@	[	¥	]	^	`	{	|	}	~
ISO15 Italian	<ESC>(0I	£	$	§	°	ç	é	^	ù	à	ò	è	ì
ISO16 Portuguese	<ESC>(4S	#	$	§	Ã	Ç	Õ	^	~	ã	ç	õ	~
ISO17 Spanish	<ESC>(2S	£	$	§	¡	Ñ	¿	^	~	°	ñ	ç	~
ISO21 German	<ESC>(1G	#	$	§	Ä	Ö	Ü	^	~	ä	ö	ü	ß
ISO25 French	<ESC>(0F	£	$	à	°	ç	§	^	~	é	ù	è	¨
ISO57 Chinese	<ESC>(2K	#	¥	@	[	\	]	^	~	{	|	}	~
ISO60 Norwegian1	<ESC>(0D	#	$	@	Æ	Ø	Å	^	~	æ	ø	å	~
ISO61 Norwegian2	<ESC>(1D	§	$	@	Æ	Ø	Å	^	~	æ	ø	å	~
ISO69 French	<ESC>(1F	£	$	à	°	ç	§	^	µ	é	ù	è	¨
ISO84 Portuguese	<ESC>(5S	#	$	´	Ã	Ç	Õ	^	~	ã	ç	õ	~
ISO85 Spanish	<ESC>(6S	#	$	·	¡	Ñ	Ç	¿	~	´	ñ	ç	¨
HP German	<ESC>(0G	£	$	§	Ä	Ö	Ü	^	~	ä	ö	ü	ß
HP Spanish	<ESC>(1S	#	$	@	¡	Ñ	¿	°	~	{	ñ	}	~

♦ HP LaserJet IIP/6P, EPSON FX-850, IBM Proprinter XL

PC-8



PC-850



♦ EPSON FX-850

US ASCII

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				0	@	P	`	p
1			!	1	A	Q	a	q			!	1	A	Q	a	q
2			"	2	B	R	b	r			"	2	B	R	b	r
3			#	3	C	S	c	s			#	3	C	S	c	s
4			$	4	D	T	d	t			$	4	D	T	d	t
5			%	5	E	U	e	u			%	5	E	U	e	u
6			&	6	F	V	f	v			&	6	F	V	f	v
7			'	7	G	W	g	w			'	7	G	W	g	w
8			(	8	H	X	h	x			(	8	H	X	h	x
9			)	9	I	Y	i	y			)	9	I	Y	i	y
A			*	:	J	Z	j	z			*	:	J	Z	j	z
B			+	;	K	[	k	{			+	;	K	[	k	{
C			,	<	L	\	l	|			,	<	L	\	l	|
D			-	=	M	]	m	}			-	=	M	]	m	}
E			.	>	N	^	n	~			.	>	N	^	n	~
F			/	?	O	_	o				/	?	O	_	o	

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the US ASCII character set. For other characters, see the US ASCII character set.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
UK ASCII I	£	$	@	[	\	]	^	`	{	|	}	~
French I	#	$	à	°	ç	§	^	`	é	ù	è	¨
Danish I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spanish	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Japanese	#	$	@	[	¥	]	^	`	{	|	}	~
Norwegian	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Danish II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
UK ASCII II	#	£	@	[	\	]	^	`	{	|	}	~
French II	#	â	à	î	ç	ê	û	ô	é	ú	è	ï
Dutch	#	$	@	[	]	ƒ	^	`	é	ij	è	¨
South African	#	ê	É	Ê	Ö	è	Ü	é	ë	ö	ô	ü

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Regulations

Federal Communications Commission(FCC) Declaration of Conformity
(For USA Only)

Responsible Party : Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911, USA
TEL : (908) 704-1700

declares, that the products
Product Name : Brother Laser Printer HL-1650, HL-1670N
Model Numbers : HL-16
Product Options : ALL

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada Only)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

International ENERGY STAR Compliance Statement

The purpose of the International ENERGY STAR Program is to promote the development and popularization of energy-efficient office equipments.
As an ENERGY STAR Partner, Brother Industries, Ltd. has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

Laser Safety (For 100–120 V Model Only)

This printer is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA Regulations (For 100-120 V Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
Brother Corporation (Asia) Ltd. Brother Buji Nan Ling Factory
Gold Garden Ind., Nan Ling Village, Buji, Rong Gang, Shenzhen, CHINA
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES LTD.
15-1 Naeshiro-cho Mizuho-ku Nagoya, 467-8561 Japan
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

Warning

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

Declaration of Conformity (For Europe)

We, Brother Industries, Ltd.,
15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan

declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class B,	EN 55024
	EN 61000-3-2,	EN 61000-3-3

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by:
Brother Industries, Ltd.
Information & Document Company

IEC 60825 Specification (For 220–240 V Model Only)

This printer is a Class 1 laser product as defined in IEC 60825 specifications. The label shown below is attached in countries where it is required.

This printer has a Class 3B Laser Diode that emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

(For Finland and Sweden)
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

Radio Interference (220-240 V Model Only)

This printer complies with EN55022(CISPR Publication 22)/Class B.

Before this product is used, ensure that you use a double-shielded interface cable with twisted-pair conductors and that it is marked “IEEE 1284-compliant.” We recommend to use a parallel cable that is 2.0 meters (6 1/2 feet) or less.

IMPORTANT - For Your Safety

To ensure safe operation the three-pin electrical plug supplied must be inserted only into a standard three-pin power point that is properly grounded through normal household wiring.

Extension cords used with the equipment must be three-pin plug type and correctly wired to provide proper grounding. Incorrectly wired extension cords may cause personal injury and equipment damage.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, consult a qualified electrician.

Disconnect device

This printer must be installed near a power outlet which is easily accessible. In case of emergencies, you must disconnect the power cord from the power outlet in order to shut off power completely.

LAN Connection

Caution

Connect this product to the LAN connection which is not subjected to overvoltages.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

IT power system (For Norway Only)

This product is also designed for IT power system with phase to phase voltage 230 V.

IMPORTANT - Wiring Information (For U.K. only)

If the power cord supplied with this printer is not suitable for your electrical outlet, remove the plug from the mains cord and fit an appropriate three pin plug. If the replacement plug is intended to take a fuse then fit a fuse with the same rating as the original.

If a moulded plug is severed from the power cord then it should be destroyed because a plug with cut wires is dangerous if plugged into a live socket outlet. Do not leave it where a child might find it.

In the event of replacing the plug fuse, fit a fuse approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug with the cover omitted.

WARNING - THIS PRINTER MUST BE PROPERLY EARTHED.

The wires in the mains cord are coloured in accordance with the following code:

Green and yellow:	Ground
Blue:	Neutral
Brown:	Live

The colours of the wiring in the power lead of this printer may not correspond with the markings which identify the terminals in your plug. If you need to fit a different plug, proceed as follows.

Remove a length of the cord outer sheath, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If the construction of the plug permits, leave the green and yellow wire longer than the others so that, in the event that the cord is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol or coloured green or green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter “N” or coloured black or blue.

The wire which is coloured brown must be connected to the terminal which is marked with the letter “L” or coloured red or brown.

The outer sheath of the cord must be secured inside the plug. The coloured wires should not hang out of the plug.

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